

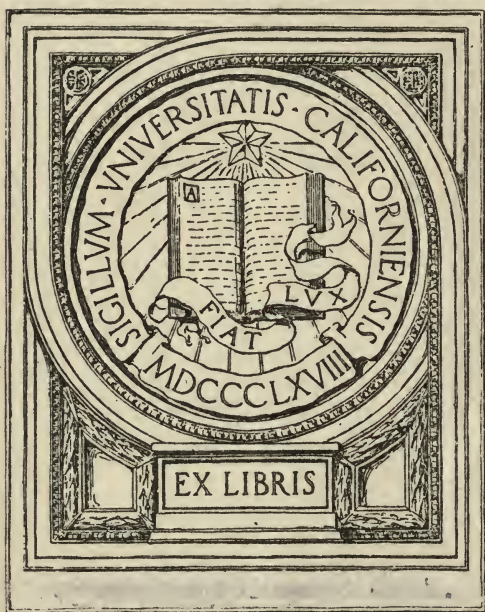
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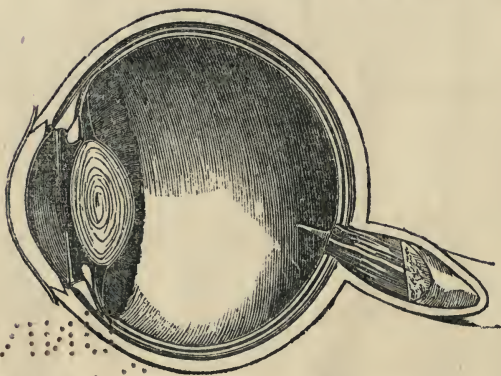
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NO. 1000
ANATOMICAL

THE EYE:
ITS DISEASES AND THEIR CURE;
COMPRISING A FAMILIAR DESCRIPTION
OF THE
ANATOMY AND PHYSIOLOGY,
OF THE
ORGAN OF VISION:
RULES FOR THE
PRESERVATION, IMPROVEMENT, AND RESTORATION OF SIGHT,
WITH REMARKS
ON OPTICS,
ON NEAR SIGHT AND AGED SIGHT;
AND THE USE AND ABUSE OF SPECTACLES,
WITH DIRECTIONS FOR THEIR SELECTION.

BY JAMES W. POWELL, M.D.,
MEMBER OF THE COLLEGE OF SURGEONS, OCULIST, AURIST; AUTHOR OF A TREATISE
ON THE ASIATIC CHOLERA, &c., &c.

Third Edition.

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History of the City of New York

From the first settlement to the present time

MY DEAR DOCTOR,

The kindness which you evinced towards me during my studies under your superintendence, from 1828 to 1833, prompts me at this distance of time and place, respectfully to dedicate to you this Treatise, in which I have attempted to popularize the science of Vision—a department of knowledge, give me leave to say, on which your genius has already shed such lustre.

I trust that this little work may not be found wanting—in usefulness to those for whose benefit it is intended. I will be

“Content, if hence th’ unlearn’d their wants may view,
The learn’d reflect on what before they knew.”

Ever gratefully,

Your Friend and Pupil,

J. W. POWELL.

DR. JACOB,

Professor of the Diseases of the Eye and Ear,
Lecturer on Anatomy and Physiology,
Royal College of Surgeons, Dublin.

New York, May 15, 1847.

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PREFACE

TO THE SECOND EDITION.

The rapid sale of the First Edition of this Work, within three short months, is a gratifying indication of public approval. The author takes this opportunity to thank his professional brethren for the kind reception they have so liberally accorded to it. To the Public he is also indebted for their favorable acceptance of it; and to the Press for their valuable commendatory notices. He has endeavoured to render it more deserving of the approbation already bestowed by a careful revision of all its parts, and by the introduction of some fifty pages of additional matter.

PREFACE.

MANY valuable and elaborate works have been published on the Eye and its Diseases. These are not generally accessible to the non-medical reader, nor indeed, clothed as they are in the technicalities of the profession, would they be easily understood by him.

Hitherto no work of a familiar nature, embracing the subjects specified in the Title Page, has appeared. I have attempted to fill up this hiatus in the popular literature of the day, by giving, in plain and concise language, which all can understand, a description of the Human Eye, the parts of which it is composed, and those that are subservient to it, both in a state of health and when affected by disease, the rules and precautions that are necessary to prevent disease, and the simplest and best means of relief in slight affections, or on the occurrence of an accident.

I have confined my observations respecting the curative means, applicable to Diseases of the Eye, to those that can be judiciously used by every person of common understanding, and have avoided alluding to the treatment of more aggravated cases because the most deplorable consequences frequently result from the use of applications, to so delicate an organ, by the inexperienced.

I have incidentally touched on the science of Optics, where the connexion was necessary to illustrate the living optical

instrument under consideration ; explained the rationale of spectacles, and accounted for their necessity in advanced age, the frequency of their use in youth, the inconceivable injury that is caused by bad and unsuitable glasses, the great comfort and advantage of those that are properly selected, together with exact rules for the accomplishment of this important object

Appropriate collations are made from scientific and standard works for the elucidation of the subject, thinking that "we ought not, like the spider, to spin a flimsy web wholly from our own materials, but, like the industrious bee, visit every store and cull the most useful and the best."

In the whole range of medical or philosophical subjects, not one can be named possessing more interest than the Science of Vision ; and where shall we seek for a subject on which the Public are less informed ? It is this want of knowledge that renders them so frequently the dupes of the ignorant empiric, who, with audacious effrontery, undertakes the treatment of diseases of an organ so peculiarly delicate and sensitive as the EYE. But its extreme delicacy and great importance will not deter the unprincipled, whose sole object is gain, from tampering with and ruining the eyes of all the unfortunate victims whom they may beguile into their net.

" Oh Heaven ! that there were but a mote in theirs,
A grain, a dust, a gnat, a wand'ring hair,
Any annoyance in that precious sense !
Then, feeling what small things are boisterous there,
Their vile intent must needs seem horrible."—*Shakespeare.*

The Diseases of the Eye, and those of other parts of the system have a general resemblance to each other. They are

influenced by the same laws which govern other diseases, and their treatment is regulated by general principles. Many of the affections of the eye depend upon constitutional causes; these must be understood and removed before the diseases of which they are the causes can be cured.

The disorders of the Eye are indeed so numerous and diversified, and some of the operations for their relief require so nice a combination of skill and delicacy that they should be attempted only by the experienced Oculist, and no one except the thorough Surgeon can make the complete Oculist. His science enables him to recognize the analogy between the Diseases of the Eye and those of other parts. His devotion and attention to this particular branch of his profession enables him to acquire that superiority and perfection, which, in any business, can be attained only by a sub-division of labor.

Shall we then trifle with this precious organ, or submit it to the rash treatment of the unskilled? How often is the Oculist consulted, alas! when too late, where by neglect or mismanagement the sight is irretrievably destroyed? We do not appreciate its inestimable value. We are scarce aware of the privations endured by those in whom it is partially or entirely annihilated, until we ourselves are sufferers: then we are ready to exclaim, in the language of the blind Bard,—

“ Oh, why was sight
To such a tender ball as the Eye confined,
So obvious and so easy to be quenched;
And not, as feeling, through all parts diffused,
That she might look at will through every pore.”

And here, I hope, it will not be deemed irrelevant, or unbecoming, if I allude to my own professional career.

My earlier opportunities of acquiring a practical knowledge of the profession were pursued under particularly advantageous circumstances, in certainly one of the best Schools of Anatomy, Physiology and Surgery, in the world—the College of Surgeons in Dublin.*

Subsequently, I engaged in extensive general practice as Physician, Surgeon, and Accoucheur. By a concurrence of circumstances I was enabled to retire from those laborious engagements, and devote myself to the more congenial branches that my earlier predilections were in favor of.

For the extensive practice I have enjoyed in this branch of Surgery I cannot make the Public a more grateful return than by presenting them with this book.

If its precepts enable them, in some degree, to understand the Eye, its imperfections, and their prevention, my wishes will be realized, my object accomplished.

* I have heard Dr. Mott state, in one of his Lectures, that he considered the Dublin Surgeons were unsurpassed for science and skill, and that if he himself was the subject of an aneurismal affection, he would immediately embark for that city and place himself under the treatment of the Dublin Surgeons.

INTRODUCTION.

All the organs appropriated to the senses by which we are connected with the material world, are necessary to our welfare and happiness; but there is none so peculiarly essential as the organ of vision.

This, though diminutive in point of size, is, nevertheless, the most important of them all. Nature has lavished all her skill in the formation and protection of this most beautiful and inimitable work.

Our unbounded admiration must be excited by the contemplation of the varied and complicated parts of which the Eye is composed; the surprising adaptation of its mechanism to the office intended to be performed by it in the animal economy; the celerity of its motions; its extreme sensibility; the wonderful power by which, in a moment, we can view the most distant or the nearest object, the lofty mountain, the lowly valley, the vast expanse of water, the starry canopy, the charming landscape, with its rich and glowing colors, all imaged with unerring faithfulness on a surface scarce an inch in diameter.

The Eye, as an optical instrument, is unapproachable. No art can ever form its equal. True, by artificial aid, we are fur-

ther enabled to penetrate illimitable space, or unravel the minute secrets of nature, but

"Why has not man a Microscopic Eye?
For this plain reason—Man is not a Fly.
Say what the use, were finer optics given,
T' inspect a Mite, not comprehend the Heaven!
God, in the nature of each being, founds
Its proper bliss, and sets its proper bounds."—*Pope*.

The sense of vision ever affords constant and continued sources of gratification and pleasure, past and present. How vividly we remember the scenes and familiar places of our youth; how lastingly they are depicted

"In the mind's eye, Horatio."

Be it our study, then, to investigate this brilliant subject, and ascertain the history of this wonderful organization.

OPTICS.

“ Let there be light; and there was light.”

“ Hail, holy light, offspring of heaven first-born,
Or of the eternal co-eternal beam,
May I express the unblamed ? since God is light,
And never but in unapproached light
Dwelt from eternity, dwelt then in thee,
Bright effluence of bright essence increate !
Or hear'st thou rather, pure ethereal stream,
Whose fountain who shall tell ? Before the sun,
Before the heavens thou wert, and at the voice
Of God as with a mantle, didst invest,
The rising world of waters dark and deep,
Won from the void and formless infinite.”—*Milton*.

The science of vision and of light, and its properties is called Optics.

The nature of light is still a disputed point. Some assert that it is a fluid pervading all space, in which waves or undu-

lations are produced by the sun or luminous body, while others contend that it consists of material particles, thrown off from the luminous body.

There are, however, certain known properties appertaining to light.

All bodies are termed luminous, which on being heated or rubbed, possess the property of discharging light.

Non-luminous bodies have not this power ; they only reflect the light which falls upon them.

For Example :—If we light a candle in a dark room, we not only see the self-luminous body—the candle, but every thing else on which its rays fall. The non-luminous bodies, as the ceiling, walls, and furniture of the room, become luminous for the time, and they in their turn throw off the light again in all directions.

Or, if we allow a ray of light to enter a dark room and fall on a sheet of paper, it becomes luminous, and from thence the whole apartment will be lighted. If we extinguish the candle in the former, or stop the entrance of the ray of light in the latter instance, all will be in darkness again.

The moon and stars are non-luminous bodies, they but reflect the light of the sun.

Light is sent forth in all directions from every visible point of a luminous body. If we hold a sheet of paper before the sun or a candle, we perceive there is no part destitute of light ; it is entirely covered with it.

All bodies discharge light of the same color as themselves, notwithstanding the light being white which they receive from

the sun. A green leaf throws off a green color; a red piece of cloth a red color.

This is beautifully illustrated by the following well-known experiment. If a sheet of white paper is held before a rose bush, the color is as usual white, but if the paper is placed at the end of a box, enclosed on all sides, and then a pin-hole is made in the side opposite to the paper to allow the light to pass from the rose-bush, and we look through another hole at the paper, we see opposite each rose a patch of red light, and opposite each green leaf a patch of green light, being an inverted picture of each flower and leaf. If we increase the first made aperture the colors will become less visible, if we still further increase it the paper will resume its former whiteness.

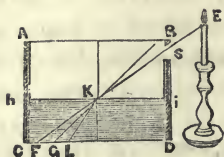
Light moves with inconceivable velocity, being at the rate of twelve millions of miles per minute. It travels from the sun to our globe in seven-and-a-half minutes; from the north to the south pole in the 24th part of a second.

Light is composed of separate parts, each independent of the other. If we close the shutter of a room and admit the light only through a small hole, and then close half of this, the rays which have passed will not be affected by their separation from those which have been stopped. If we further close the hole, the smallest beam which we then allow to pass, is called a *ray of light*.

Rays of light proceed in straight lines. This would have been evident during the last mentioned experiment if the room had been filled with smoke or dust.

Although a ray of light proceeds in a straight line, yet if it be interrupted it can be bent. For instance, a ray of light passing through a bottle, containing fluid or a piece of glass, does not illuminate a sheet of paper placed behind those sub-

stances as it did before. This, then, is termed refraction, which will be illustrated by the accompanying diagram.



A. B. C. D. represents a vessel with a hole at S. E. is a lighted candle within a short distance of it; then a ray of light E. S. will pass through the aperture S. and go in a straight line to the bottom of the vessel at F. where it will form a small circle of light. Mark the point F., now fill with water to the line h. i., then the round spot, before at F., is found at G.; the ray has been bent at the point K., where it falls into the water, into the line K. G. If we pour in alcohol instead of the water, we will find the beam of light more bent at K.; but if we substitute a piece of solid glass for the alcohol, we will perceive it still more bent, so as to form the line K. L.

The power which thus changes the ray of light is called refraction, therefore we say that a ray of light falling in a slanting direction upon a liquid or solid body, through which it can pass, is refracted by them, and by different bodies, in different degrees.

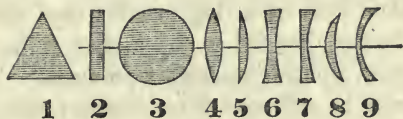
We have all observed that when an oar is immersed in clear water it appears crooked or bent into an angle, where it enters the water. This appearance is caused by the above law of refraction.

Rays of light which approach each other, as they advance, are called converging rays.

Those which recede from each other as they proceed, are termed diverging rays. The point at which the former converge is called its focal point.

The distance of the focal point, from the refracting surface, is called the focal distance.

Glass is the substance generally used in optical instruments, and in experiments for refracting the rays of light. The following figures represent the different forms which are used :



1st. A prism. This is a solid, having two plane surfaces inclined to one another.

2d. A plane glass has two plane surfaces parallel to one another.

3d. A sphere has every point in its surface, equally distant from a common centre.

4th. A double convex lens is bounded by two convex spherical surfaces, whose centres are on opposite sides of the lens.

5th. A plano-convex lens is bounded by a plane surface on one side, and by a convex one on the other.

6th. A double concave lens is bounded by two concave spherical surfaces whose centres are on opposite sides of the lens.

7th. A plano-concave lens is bounded by a plane surface on one side and a concave one on the other.

8th. A meniscus is bounded by a concave and a convex spherical surface, and these two surfaces meet if continued.

9th. A concavo-convex lens is bounded by a concave and a convex surface, but these two surfaces do not meet though continued. Each of these various forms has a different refractive power.

The refractive power of curved surfaces are those most generally used in optics. The burning glass derives its power from the convex lens refracting parallel rays to a focus. All the rays of the sun that fall on the surface of the glass are collected to a point, and intense heat is produced. The rays may also be collected by reflection from concave looking-glasses or specula. The great mathematician Archimedes, when his native city of Syracuse was besieged by the Romans, under Marcellus, it is said, burned their entire fleet by means of mirrors. The naturalist Buffon set fire to planks of wood at 150 feet distance by the same means. In more recent times the celebrated burning-glass of Parker produced so great a heat that iron plates were melted by it in three seconds, and gold exposed to its influence was almost instantly rendered fluid. It is by the property of a convex lens which refracts rays proceeding from its focus into parallel directions that light-houses throw a strong light to great distances.

The microscope is simply a convex lens, in the focus of which minute objects are held; the object is placed near the eye, its apparent magnitude is increased, and the rays flowing from each of its points are refracted into parallel rays, and the eye is thus enabled to see small things with great distinctness.

The magic lantern is formed by a plano-convex lens being fixed in the tube which projects from its front. Behind and within the lantern is a lamp, the light from which passes

through the lens and powerfully illuminates objects painted on slips of glass which are placed before the lens in an inverted position; and these images are received on a white sheet or surface arranged for the purpose. This little machine affords to young persons a good deal of pleasure and amusement.

The extraordinary phenomenon of the *mirage* or *looming*, by which ships, coasts, and mountains seem elevated above their proper level, is caused by an unusual refractive power of the atmosphere, produced by vapors and dense exhalations.

M. Monge, in the *Memoires sur l'Egypte*, states that when the French army was marching through the sandy deserts of Lower Egypt, they saw various phenomena of unusual refraction to which they gave the name of *mirage*. When the surface of the sand was heated by the sun, the land seemed to be terminated at a certain distance by a general inundation. The villages situated on eminences appeared to be so many islands in the middle of a great lake, and under each village there was an inverted image of it. As the army approached the boundary of the apparent inundation the imaginary lake withdrew and the same illusion appeared around the next village.

A most interesting case of *mirage* was observed and described by Dr. Vince. From Ramsgate the tops of the turrets of Dover Castle are just visible over a hill between Ramsgate and Dover. Dr. Vince, however, on one occasion saw *the whole of Dover Castle* as if it had been brought over and placed on the Ramsgate side of the hill. The image of it was so strong that the hill itself was not seen through the image.

Captain Scoresby, while sailing in the Greenland Sea, recognised his father's ship when *below* the horizon, from the inverted image of it which appeared in the air. He stated that

it was so well defined he could distinguish with his telescope every sail, the general rig of the ship, and its particular character, insomuch that he confidently pronounced it to be his father's ship, the *Flame*, which it afterwards proved to be. In comparing notes with his father he found that their relative position at the time gave a distance from one another of nearly thirty miles, being about seventeen miles beyond the horizon, and some leagues beyond the limits of direct vision.

The *fata morgana*, which is seen in the straits of Messina, and which for ages puzzled philosophers, and confounded the vulgar, is now well known to be but another instance of this peculiar refraction. Minasi, in his glowing description of it, states that an individual standing on an eminence in the city of Reggio, with his back to the sun, and face to the sea, when the rising sun throws his rays at an angle of 45° on the sea of Reggio, can perceive upon the water, numberless series of pilasters, arches and castles, well delineated; regular columns, lofty towers, superb palaces with balconies and windows, villages and trees, plains with herds and flocks, armies of men on foot and horseback, all passing rapidly in succession on the surface of the sea. These same objects are in particular states of the atmosphere seen in the air though less vividly, and when the air is hazy they are seen on the surface of the sea brilliantly fringed with the prismatic colors.

REFLEXION OF LIGHT.

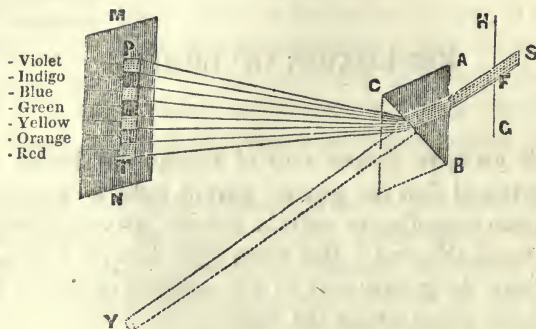
Hitherto we have spoken only of transparent bodies. We have ascertained that the greater part of light is transmitted through them according to certain definite laws—a small portion only being reflected. But when light falls on a bright or polished body, the greater part of it is reflected or driven back, the remainder is lost within the body.

The bodies which are generally used for this purpose are mirrors, or specula, commonly made of metal or glass, having their surfaces highly polished. Those of glass are usually quick-silvered on one side, so as to reflect more light. The principle of the formation of images by mirrors is precisely the same as by lenses.

When two plane mirrors are combined in a particular manner, and placed in a particular position relative to an object, or series of objects and the eye, they constitute the *kaleidoscope*. In order to give variety to the figures formed by the instrument, the objects are placed in a narrow cell between two circular pieces of glass, leaving them just room to move about while the cell is turned round by the hand. The pictures thus presented to the eye are, beyond all description, splendid and beautiful.

We have as yet only described light as a simple substance; but the white light which is derived from any luminous body is, in reality, composed of seven different kinds of light, of different colors.

Sir Isaac Newton exemplified this wonderful discovery in this way—



In a window shutter H. G., of a dark room, Newton made a hole F. one third of an inch broad, and he placed behind it a glass prism A. B. C., so that the beam of light, S. F., might enter and leave the prism at equal angles. Before the prism was so placed, the beam, S. F., proceeded in a straight line to Y., where it formed a white spot; but being now refracted by the prism, it will form on the screen, M. N., an oblong image P. T., containing seven colors, as enumerated. The oblong image is called the solar or prismatic spectrum; and these rays which have been thus separated can be again collected by a lens, and white light reproduced.

The compound nature of white light can also be demonstrated by painting the rim of a wheel with the seven prismatic colors, and making it revolve rapidly about its axis the colors will disappear, and white will alone be perceptible.

The beautiful prismatic colors that are seen in *mother of pearl*, have their origin in a particular configuration of its surface. Brewster, while making some interesting experiments on this subject, was surprised to find that mother of pearl had

the power to communicate its colors to other substances on which it was impressed, as black wax, isinglass, gum arabic, balsam of tolu, fusible metal and lead, thus conclusively proving that the colors are caused by the peculiar grooves or elevations and depressions on the surface of the pearl.

Barton very ingeniously applied the principle of the production of color, by grooved surfaces, to various substances. He contrived a machine that was capable of cutting grooves upon steel at the distance of from the 2000th to the 10,000th of an inch. He afterwards manufactured imitation jewels, buttons, and other ornamental articles of surpassing beauty and splendor. To these he gave the name of Iris ornaments from their resemblance to the varied colors of the rainbow. Nothing in nature or art can surpass their brilliant display of colors. In ordinary light these colors are scarcely distinguishable, but in strong light, particularly that of the sun or gas, the colors shine with surprising brilliancy, and the play of tints which flit about with every luminous image are rivalled only by the matchless hue of the diamond.

The Rainbow.—This beautiful phenomenon which we see when the sun is shining, and the rain falling between us and the part of the horizon where the bow is seen, is caused by the decomposition of the white light of the sun by the refraction of the drops of rain and their subsequent reflection within the drops. It consists of two bows or arches, extended across the sky, and glowing with all the colors of the prismatic spectrum.

“ Now, overhead, a rainbow bursting through
The scattering clouds, shone, spanning the dark sea,
Resting its bright base on the quivering blue:
And all within its arch appear'd to be
Clearer than that without, and its wide hue
Wax'd broad and waving like a banner free,
Then changed like to a bow that's bent.

It changed of course ; a heavenly chameleon,
 The airy child of vapor and the sun,
 Brought forth in purple, cradled in vermillion,
 Baptized in molten gold, and swathed in dun,
 Glittering like crescents o'er a Turk's pavilion,
 And blending every color into one,
 Just like a black eye in a recent scuffle,
 (For sometimes we must box without the muffle.)"

Brewster reduces the seven prismatic colors to three primitive colors, red, yellow and blue.

Each of the colors formed by the spectrum has different heating powers, independently of those of light ; the blue and green being the coolest.

Thermometrical observations have determined the relative heating powers of these three primitive colors, as shown in the annexed scale :

Blue rays	-	-	56	} Fanrenheit.
Yellow	-	-	62	
Red	-	-	72	

The varied tints and colors of objects that we behold are not inherent in them as is generally supposed. It is the action of matter upon light, decomposing it, attracting certain of the prismatic colors, and reflecting others, that produces color.

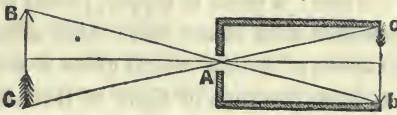
Most bodies act, as we have seen the prism, by dividing white light into its component parts ; they then absorb, or they transmit, certain rays, and throw back the remainder. If we assert a body is of an orange color, we mean to say it reflects the orange ray. Objects that are black absorb all the colors, while those that are white, reflect them all. Green cloth absorbs all the colors but green, which it throws back. So blue cloth absorbs all the colors but blue, which it reflects.

Recent investigations have established the fact that certain of the prismatic rays possess the property of communicating magnetism. A needle having been exposed to the violet rays for two hours acquired north polarity. The indigo, blue and green, produced the same effect, but in a less degree. The yellow, orange, and red rays appeared to be destitute of this power. Professor Faraday is now engaged in a series of experiments on this curious and interesting subject.

FORMATION OF IMAGES.

If we make a hole in the shutter of a room, and hold a sheet of paper a short distance from it, an image of the objects on the outside will be depicted on the paper. This is the simplest way in which images can be produced.

Or, if we take a box with a hole in one end of it at A., as represented in the Figure



we will perceive that an inverted image of the object B. C. will be formed at the back of the box b. c. The rays from the object B. C. pass in straight lines through the hole A. to form the image. It is evident the image must be upside down, because the rays from the upper end B., of the object cannot be bent to the upper end of the image at c. If we now enlarge the aperture A., and place a double convex lens in it, we shall have the image brighter and more distinct.

When the image b. c. is received on a smooth white surface at the back of the box, the apparatus is termed a *camera-obscura*, but when the eye is placed behind the lens and sees the image in the air, the instrument is called a *telescope*.

The principle of the telescope is this: the object glass forms in its focus a distinct image, which though smaller than the object, is yet seen under a much greater angle, or magnified, and the image so magnified is seen under a still greater angle, or still farther magnified by the eye-glass which enables the eye to see distinctly at a less distance than six inches.

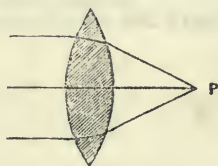
The Daguerreotype, one of the most remarkable and beautiful discoveries of this age of inventions, enables us to fix on metal plates the images derived from the camera obscura. This ingenious process has been brought to great perfection in this country. The portraits exhibited by Mr. M. B. Brady, at his gallery 205 Broadway, are especially deserving of attention. They attract and command the admiration of the artist and connoisseur. He seems to be particularly happy in creating beautiful and *life-like pictures*, entirely obviating the ghastly appearance presented in some impressions. The *modus operandi* is very curious: a piece of copper, plated with silver, is cleansed and polished with dilute nitric acid, after which it is exposed to the vapour of iodine, which gives it a yellow color, and upon this surface the rays of light of the object are impinged by the camera obscura; the plate is then subjected to the action of the vapour of mercury; it is next washed with a solution of hypo-sulphate of soda and then with boiling water. When dry we have a perfect picture of the object intended to be delineated, but without color, further than degrees of shade.

By the introduction of Bromine and other chemicals, a great improvement has recently been effected in the art of taking perfect pictures, and the time of sitting is now reduced to a few seconds.

These preparations greatly increase the sensibility of the plate to light, consequently the contrast between the white and dark places is more marked. The application of Bromine causes the rapid reception of the image on the plate, and produces the deep black shades of an object. This is a very decided advantage, as the countenance preserves its natural appearance for a short period only, and becomes constrained and unnatural if the time of sitting is much extended. A long sitting has also the effect of rendering the picture bluish where it ought to be white, and brown where it should be dark. Chloride of gold is very successfully used to fix and enliven the tints of a picture. By the application of various pigment powders to Daguerreotype pictures, the appearance of colored miniatures has been closely imitated. The best pictures, it is said, are taken from an hour after the sun rises till he comes within 45° of the meridian, and again after he has passed the meridian by 45° .

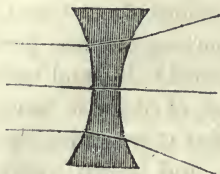
Photography, Calotype, Chrysotype, and Cyanotype, are various modifications of the art of making pictorial impressions of objects by the action of light upon paper.

The ray of light which is perpendicular, passes straight through the lens, while the lateral rays, passing obliquely, are converged by the lens to their focal point at P.



The more convex the lens is the nearer will be its focal point, and the flatter it is the greater distance off will be the focus.

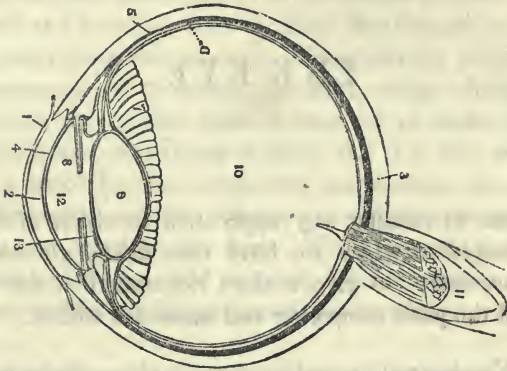
A double concave lens refracts rays in the contrary direction, that is to say, instead of coming to a focus, they diverge as they proceed.



Hereafter we shall see the close connexion that exists between the laws of optics on which we have touched and those which govern vision, and we shall thereby be the better enabled to understand the causes of near sight and far sight, and the reason why those imperfections are relieved by the use of concave or convex glasses.

It would be foreign to the plan of this little work to have entered more deeply into this part of our subject, but thus much was necessary for its elucidation.

VERTICAL SECTION OF THE EYE.



EXPLANATION.

1. Conjunctiva covering the cornea.
2. Cornea, or clear part of the eye.
3. Sclerotic, or white of the eye.
4. Membrane of the aqueous humour, or inner lining of the chamber.
5. Choroid, or vascular coat.
6. Retina, or nervous expansion.
7. Ciliary processes.
8. Iris, or colored curtain of eye with pupil in centre.
9. Crystalline lens, or principal magnifier.
10. Vitreous humour, forming principle bulk of eye.
11. Optic nerve.
12. Anterior chamber.
13. Posterior chamber.

THE EYE.

Previous to making any application to vision of those optical principles at which we have thus briefly glanced, it becomes necessary to give a short description of the Human Eye, and the parts composing and connected with it.

The Eye is nearly round in shape, with a slight projection in front—hence commonly called the eye-ball or globe of the Eye. This particular form is the very best that could be contrived to enable it to move about with the greatest facility and rapidity.

The Eye consists of three orders or classes of parts;—the first admit and modify the rays of light; the second receive and carry the impressions to the brain; and the third keep those organs in a fitting state to fulfil their functions.

The Eye is protected on all sides by the bony socket, in which it is lodged, except in front, and here we have the eyelids like watchful sentinels, ever on the alert, to guard and protect it from approaching danger.

The Eye is composed of four coats:—the Sclerotic, the Choroid, the Retina, and the Cornea, and three humours—the Aqueous, the Vitreous, and the Chrystalline.

These humours or lenses are transparent and very delicate, and require to be protected and supported by some strong substance. For this purpose we have the outer coat or case, termed the *Sclerotic*, or the "white of the Eye." It is a strong and dense substance, and extends, surrounding the eye, from the optic nerve behind to the Cornea in front. Here it is cut off and bevelled, so as to allow the Cornea to fit into it, as a watch glass into its case. The Sclerotic is opaque, it being necessary not to admit any light except through the pupil, just as the optician finds it essential to make the case for his telescope impervious to light, and it is cut off before to allow a space for the transparent membrane—the Cornea. We shall hereafter see that the muscles which give motion to the ball are attached to this case. The Sclerotic in fishes is very dense and strong; and in many birds it consists of three layers, the middle one being formed of bony plates.

The *Cornea* is the clear, polished and brilliant substance that forms the front of the Eye. It is very tough and strong, so as to protect the parts within; and yet it is perfectly transparent to admit the rays of light, which are here first refracted.

Within the Sclerotic lies the *Choroid*, which, like the former is wanting in front. It is very fine and delicate, and full of blood vessels. These secrete a dark coloring matter, the *Pigmentum Nigrum*, with which its entire inner surface is coated or painted. This dark substance absorbs all the superfluous rays of light. It is wanting in the Albino and in animals of prey. These cannot see distinctly in a bright, strong light, but in darker situations their eyes concentrate and reflect the light, and their power of vision is then much more acute. The eyes of cats, and such animals, appear in the dark to glow with a particular ferocity: this is not owing to the animals being excited, but is occasioned by the want of this dark pigment. The Choroid, externally, seems to termi-

nate in front, where the Sclerotic and Cornea are joined together; and where it is connected with a white ring or ligament, but it extends inwards in the form of 60 or 70 beautiful folds, or processes, called the Ciliary. These are arranged in a radiated manner around the lens, on the front of the vitreous humour: each of these folds is covered with the dark pigment, similar to the choroid itself.

Interior to the Choroid is the *Retina*: this is an expansion of nervous matter connected with the optic nerve. It is a thin and delicate membrane, which commences at the optic nerve, and extends around the sides of the vitreous humour, nearly as far forward as the lens. It can be divided into three layers. The external or serous was discovered by my old preceptor, Dr. Jacob, and called after him the *membrana Jacobi*, or membrane of Jacob. It is extremely delicate and fine. The second, or nervous, is soft and gray; and the internal is vascular. The retina is, as we have observed above, the nervous expansion, and on it the inverted image of the object we look at is depicted, just as we have seen in the camera obscura.

We have said the humours of the Eye are three in number—the Aqueous, Vitreous, and Crystalline.

The *Aqueous humor* is a clear watery fluid, as its name implies; it is situated immediately behind the cornea, which it distends and supports. This fluid passes from the front to the back chamber of the eye through the pupil; it aids slightly in refraction. There is a beautiful provision made (the membrane of the aqueous humor) whereby if it is lost through a wound of the cornea, it is again renewed within a few hours. The Aqueous humor is also of great use in supporting and enabling the iris to float about with perfect freedom.

The *Iris* is the colored curtain which we see on looking into

the eye. It derives its name of iris or rainbow from the variety of colors it presents. It is a flat membrane, circular in form, with a round aperture in the centre: this is the black spot, termed the *pupil*, or sight of the eye. The iris divides the eye into a front and back chamber, and these communicate through the central aperture—the pupil. The iris is very important to vision; it acts as a curtain, regulating the quantity of light that is admitted to the eye, so that the pupil contracts in bright light, and enlarges in darkness or in moderate light. This can be observed by sitting opposite to a mirror and closing the eyes for a few seconds; then, suddenly opening them, we will see that, in the interval, the pupil has become much enlarged and now quickly diminishes.

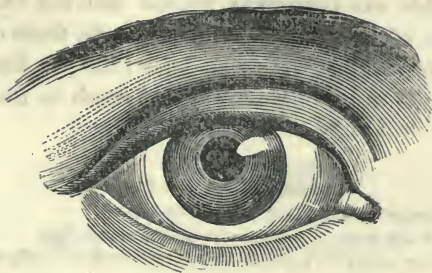
The color of the iris varies in different individuals. There are some persons who have one of their eyes blue and the other black, and instances have occurred in which the upper half of the iris has been gray while the lower part was brown. Occasionally the fibres assume an irregular shape so as to give an appearance remotely resembling the letters of the alphabet. A child was some time ago exhibited in France and England, on whose iris it was stated the words "NAPOLEON EMPEREUR" could be plainly discerned. A strong imagination, or a little credulity, perhaps, was necessary to enable the wonder-loving and the curious to decipher the magic words.

It is to the Iris that the eye owes its greatest attraction. Poets have sung of the beauty of the black, the blue, and the gray. Lord Byron says,—

"Blue eyes, or gray,
The last, if they have soul, are quite as good,
Or better as the best examples say:
Napoleon's, Mary's (Queen of Scotland) should
Lend to that color a transcendent ray;
And Pallas also sanctions the same hue—
Too wise to look through optics black or blue."

The *Chrystalline* humour or lens is a transparent body of considerable firmness, having the form of a double convex lens, and is placed perpendicularly behind the pupil: it is imbedded in the forepart of the vitreous humor. The lens is the principal magnifier of the eye.

The third, or *vitreous* humor, forms the main bulk of the globe of the eye, filling its two posterior thirds; it is thin and watery, but is contained in numerous cells which prevent its running out when cut or wounded.



We will now consider what provision nature has made to preserve and keep this beautiful organ in order.

We have already alluded to the protection which the eye receives from the bony cavity in which it is lodged. Our attention is next attracted to the *eye-lids*.

These vigilant guardians protect the eye from danger, control the quantity of light that is admitted, and by their winking motion keep it moist and bright, and wipe away dust or any extraneous matter. A thin plate of cartilage, the *tarsus*, is added to the other textures that compose the eyelids; this gives them a proper degree of firmness, and as it is thicker towards the margin of the lids it assists in supporting the eyelashes. Near the edge of each lid, at the root of the hairs, are a number of small glands, the *meibomian*, which secrete a semi-fluid substance that assists in lubricating the surface and preventing the tears from running over on the cheeks. There is a minute hole at the inner angle of each eyelid: these lead by small passages into the lacrymal sac, and this communicates with the nose. When the eyelids are closed they form at their margin a channel through which the tears pass into these little openings and from thence into the nose.

At the inner angle of each eye is a small reddish body, termed the *caruncula lacrymalis*; it secretes a fluid which aids in keeping the eye moist.

The eyelids are beautifully fringed with the *Cilia*, or eye-lashes; those of the upper lid curve upwards, those of the lower lid downwards. The eye-lashes defend the eye from dust, and also modify the rays of light; they add much to the expression of the eye—

“ In whose silk shadow lies
Deepest attraction, for when to the view
Forth from its raven fringe the full glance flies,
Ne’er with such force the swiftest arrow flew.”—*Byron*.

The eyelids are closed by a muscle which surrounds the eye, the *orbicularis palpebrarum*, and are opened by the *levator palpebræ*, a muscle which stretches from the bony socket, and is connected with the upper lid; by its contraction the lid is elevated.

We perceive that the *eye-brow* is also provided with hairs; these are placed in an oblique direction, and prevent the perspiration from the brow running into the eyes.

The *lacrymal gland* is placed under the fore part of the upper eye-lid; it secretes the tears which are poured out by a number of small ducts over the surface of the cornea. This preserves the part in a moist state, removes dust, or any thing which may accidentally enter the eye, and prevents the friction of the lids on the ball. By the motion of the lids the tears are constantly diffused over the surface of the eye.

Next we observe a mucous membrane or skin lining each lid, and covering the front of the globe, and continued through the tear passage into the nose. This, which is termed the *Conjunctiva*, joins the eye-lids to the eyes, supports and confines the eye-ball in its several motions, and closes the orbit against any foreign substance.



MUSCLES OF THE EYE.

We have now to speak of the arrangement for moving this instrument in all directions. There are six muscles to each eye, four named from their form and position straight, and two oblique. The four straight muscles are attached behind to the bone around the entrance of the optic nerve, and before to the sclerotic coat of the eye, one above to elevate, one below to depress; one on each side to direct the eye outwards or inwards. The upper oblique muscle arises from the bone behind, and passing forward ends in a round tendon which plays through a pulley and then bends back and is inserted into the sclerotic. Its use is to rotate the eye. From the peculiar expression of countenance which the action of this muscle produces, Dr. Jacob very appropriately termed it the *pathetic*.

The lower oblique commences at the front and lower part of the orbit, and ascending backwards and outwards, is attached to the sclerotic; this also assists in the rotary motion. By means of these muscles we are enabled to move the eye in all directions with the greatest facility and correctness.

The muscles derive all their motive power from the nerves, without which they would be utterly impotent. The optic nerves, or the *nerves of vision*, take their origin from the lower part of the brain, and pass forward, converging towards each other till they meet, where they decussate or cross each other;

they then separate, and each proceeds forwards and outwards to the back of the orbit, which they enter through a round hole in the bone (the *foramen opticum*), and piercing the sclerotic and choroid coats, terminate in the cup-shaped expansion—the thin and delicate retina.

The optic nerves are not the only nerves connected with vision, for the eye and its surrounding parts are abundantly supplied with nerves derived from other sources. These serve to give the muscles voluntary motion, and some to assist in the various functions of the organ. The branches of the fifth pair of nerves, which are distributed to the nose, are also connected with the respiratory system. When, therefore, these are irritated, sneezing is produced. We sometimes, on looking suddenly at the sun, sneeze. This is owing to a small branch of the fifth pair of nerves, which connects with the lacrymal gland and the Schneiderian membrane or the lining of the nose. From the same cause, if the tip of the nose is pulled, or irritated, the eye sheds tears.

The eye is also very freely supplied with blood-vessels. The middle, or choroid coat, is almost exclusively formed of a tissue of blood-vessels; these secrete the dark pigment, of which we have already spoken. The tortuous course which the ciliary arteries pursue, in passing forward to the ciliary processes, is very remarkable, as by this arrangement no obstruction is offered when the crystalline lens is brought forward in its adjustment to different distances.

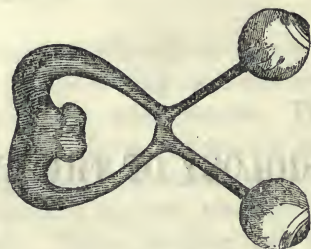
PHYSIOLOGY OF THE EYE.

Having now seen the parts that compose this instrument, we will briefly point out how vision is produced. The convexity of the cornea and the lens, and the density of the different humours, is such that when parallel rays of light fall upon the cornea and pass through the pupil they are brought to an exact focus on the retina, where an inverted image is depicted of the object towards which the eye is directed. This can be proved by cutting or paring away a portion of the sclerotic coat of the eye of an ox, and holding it up at the window, when we will behold an inverted picture of whatever object we direct the eye towards.

We may now perceive that the organ acts altogether mechanically, the rays of light being affected by the humours through which they pass, exactly in the same manner as if they had been transmitted through a convex lens.

But the eye is greatly superior to any optical instrument, inasmuch as it is entirely free from spherical and chromatic aberration.

The impression made by the rays of light on the retina is conveyed along the optic nerve which meets and interlaces with the one of the opposite side, as exhibited in the engraving.



They then separate, and each proceeding to the brain, vision is produced.

The retina retains the impression of light made on it for some time after the cause has been removed. This is proved if a burning body is rapidly whirled around, for the eye perceives a complete and unbroken circle of light.

From the same cause the seven prismatic colors, as we have seen, when painted on a wheel, and rapidly revolved, assume a white color. No separate color will be seen, but the eye will receive the general sensation of whiteness from the combined impression of the whole.

This peculiarity of the eye has been ingeniously used in the construction of the *Thaumatrope* and other toys. On a round piece of card is painted a carriage, and on the reverse side the driver; to the circular card is attached two silk strings, when twisted with the fingers so as to revolve with great velocity we see the coachman in the attitude of driving, in other words, we see at the same time what is drawn on both sides of the card.

There is a curious phenomenon appertaining to the eye, by which it sees accidental colors. If we close one eye, and look steadily for some time at a red wafer on a sheet of white paper, and then turn the same eye to another part of the paper, we shall see a green wafer: this green image is termed an ocular spectrum. If we use different colored wafers, the following will be the result:—

Black,	White,
White,	Black,
Red,	Blueish Green,
Orange,	Blue,
Yellow,	Indigo.

This peculiarity is caused by the retina being unable to persevere in the same kind of action beyond a certain period, and the spectral color is always that which would result from a union of all the prismatic colours except the one to which the eye had been previously exposed, and to the action of which it had consequently become more or less insensible.

Doubtless, as an intelligent writer observes, the harmony of colors and the richness of effect, as exhibited in pictures, or in the arrangement of drapery or furniture, depends in a great degree on these ocular spectra, or accidental or opposite colors, the brilliancy of the colors being much increased by the position in which they stand opposite to each other.

By means of pressure on the eye-ball, ocular spectra may be produced. In particular states of the stomach, the pressure of blood-vessels on the back of the retina often produces spectra; in slight affections these resemble floating masses of blue light, appearing and disappearing; in some cases they become green and occasionally yellow. These sometimes may have given rise to the belief in supernatural appearances, even after the

exciting cause is removed the spectrum will often still remain visible, and the mental powers themselves being perhaps also weakened, render them peculiarly susceptible of being affected by superstition and credulity.

If the eye is steadily directed to objects illuminated by a feeble light, it causes as much pain as is produced by an excess of light, a kind of remission takes place in the conveyance of the impressions along the nervous membrane, the object actually disappears, and the eye is agitated by the recurrence of impressions which are too feeble for the performance of its functions. Brewster says that this may serve to explain some of the phenomena of the disappearance and re-appearance of objects, and the change of shape of inanimate objects, which have been ascribed by the ignorant to supernatural causes, and by philosophers to the activity of the imagination. If in a dark night, for example, we unexpectedly get a glimpse of any object, either in motion or at rest, we are naturally anxious to ascertain what it is, and our curiosity calls forth all our powers of vision. This anxiety, however, serves only to baffle us in our attempts. Excited by feeble illumination, the retina is not capable of affording permanent vision of the object; and while we are straining our eyes to discover its nature, it will entirely disappear and afterwards re-appear, and vanish alternately. The same phenomenon may be observed in day-light by the sportsman when he endeavours to mark on the monotonous heath the particular spot where game has alighted. Availing himself of the slightest difference of tints in the adjacent heath, he keeps his eye steadily fixed upon it as he advances, but whenever the contrast of illumination is feeble he invariably loses sight of his mark, and if the retina is again capable of taking it up it is only to lose it a second time.

A singular affection of insensibility to certain colors, has been observed in several cases, where vision was otherwise

perfect, and it would seem to be hereditary. Some can only distinguish white and black. There is a curious case related in the Edinburgh Transactions, of a tailor who could only distinguish with certainty white, yellow, and gray. On one occasion he repaired an article of dress with crimson instead of black silk, and at another time he patched the elbow of a blue coat with a piece of crimson cloth.

Another case is recorded where a naval officer purchased a blue uniform coat and waistcoat, with red breeches to match the blue coat.

And a well authenticated anecdote is told somewhere, by Dr. Priestley, if I remember right, of an artist, who was entirely unable to distinguish some colors. He was therefore obliged to keep them in a certain series or order, as the only means by which he could discriminate between them. His companions sometimes amused themselves by disarranging this order, and the unconscious artist would thus give a gentleman a green beard or moustache, and adorn a beautiful young lady with a pair of blue cheeks.

With regard to the apparent magnitude of objects at a distance, there is no doubt we judge of them by experience and association. We calculate their apparent size from what we know to be their real size, the distinctness with which they are seen, the vividness of their colors, the number of intervening objects, and our supposed knowledge of their distance.

The arts of landscape and architectural painting, and still more remarkably the science of perspective, depend entirely upon the principle that we judge of the size of objects by their distance. If the artist is able to convey to our minds a correct conception of the position in which the different objects are supposed to stand with respect to each other, we immediately con-

ceive of them as presenting the size that they actually possess, without any relation to the space which they occupy on the canvass.

In blind persons the sense of touch supplies many of the impressions which, under ordinary circumstances, are produced by sight. The blind will sometimes estimate, with considerable correctness, the size of apartments. This knowledge they acquire by attending to the force of the reverberation which is produced from the walls, and it depends upon their comparing the effect thus produced upon the ear, in the case under consideration, with their previous experience in similar circumstances.

With regard to *Singleness of Vision*, we observe that when both eyes are directed to an object, a separate image is formed upon each retina; yet the mind forms only the conception of one object. This is invariable, except where disease or accident prevents the eyes from moving in concert—as in delirium and intoxication. When the usual train of associations is interrupted, double vision is sometimes produced. In such cases the eyes do not move in a parallel direction, and consequently, the impressions are not made on corresponding parts of the retina.

The eye, when in a state of repose, is adjusted to remote objects. When we wish to view near objects, we use a voluntary exertion, by which we bring forward the crystalline lens, and thus we perceive how admirable is the organization by which the eye instantaneously adapts itself to every degree of distance.

DISEASES OF THE EYE.

We shall now proceed to give a short description of the Diseases of the Eye.

Ophthalmia, which is derived from the Greek *ὀφθαλμία*, signifies an inflammation of the conjunctiva covering the eye and lining the lids. It is a disease of frequent occurrence, and is caused by exposure to cold or damp, to intense heat or brilliant light, to dust or any extraneous substance that irritates the eye. It is also occasioned by the general state of the health, and some persons have a peculiar tendency to this affection.

Symptoms.—One of the earliest sensations is a feeling as if sand or dust was lodged in the eye. This is occasioned by the blood-vessels being swollen and larger than usual, and causing with every motion of the eyelids considerable friction. The eye presents the red appearance commonly termed “bloodshot.” Exposure to light is painful; there is an increased flow of tears, and sometimes pain in the temple and head.

In some cases the disease is slight and disappears by simple means; in others it extends to the adjoining parts of the eye, and the sight is greatly injured or perhaps entirely destroyed—thus indicating the necessity of attention to the slightest attack, as such untoward consequences may result from neglect.

Treatment.—In mild cases, aperients, abstinence from stimulants, and either warm or cold applications as is most agree-

able to the patient's feelings, is all that will be required. A soothing warm application may be made by boiling

2 oz. of Poppy heads in one pint of water,

or,

20 grs. of extract of opium may be dissolved in half a pint of warm water, and

2 oz. of spirits of Mindererus added thereto.

Lay a piece of flannel, wrung out of either of these preparations over the eye and brow, and change it frequently so as to maintain the soothing and beneficial effect.

10 grs. of sugar of lead,
Half a pint of cold water, and
Half oz. of vinegar.

will make a suitable cold lotion. A single fold of linen cloth, saturated in this solution, must be laid over the eye and frequently changed. Never apply poultices or compresses to the eye ; they increase the heat and inflammation, and prevent a free circulation of air around the eye. If the light is hurtful to the eyes wear a shade, or remain in a room where the light is partially or entirely excluded.

If the attack is severe, it may be necessary to bleed both from the arm and locally. Should the disease, however, progress to this state, it is absolutely necessary to consult an oculist, as it may rapidly extend and cause irremediable injury.

Cases have occurred where both eyes were totally destroyed in twenty-four hours although the attack was not accompanied by much pain.

CHRONIC OPHTHALMIA.

The acute form frequently degenerates into the chronic. This also arises very gradually and almost imperceptibly from any of the causes mentioned in the last chapter ; from tumours within the eye, granular lids, or from the eye-lashes growing inwards.

Symptoms.—The blood-vessels have lost their natural tone, are enlarged and distended ; the eye is weak and watery, and there is more or less irritation. The lids frequently are glued together in the morning by a discharge of adhesive matter that accumulates during sleep.

The treatment must be directed to the removal of the cause, and the strengthening of the debilitated vessels. For the latter purpose

Take 2 grs. of sulphate of copper,
1 oz. of water.—Mix,

or,

4 grs. sulphate of zinc,
1 oz. of rose water.—Mix.

Drop one or two drops of either of these into the eye, night and morning, and apply before going to bed a small portion of the following salve to the edges of the lids :—

1 dr. of citrine ointment,
3 dr. fresh hog's lard.—Mix.

Before applying the remedies night and morning, wash off with a little tepid water and a linen cloth any matter that has collected about the roots of the eye-lashes. This should be carefully and completely done, otherwise the applications will not reach the affected parts. After washing, as above, use the eye-water ; carefully dry the eyes with a piece of linen,

and then with the finger rub the salve gently but thoroughly into the lids and the roots of the eye-lashes.

If these remedies do not produce the desired effect the patient must seek further advice.

EGYPTIAN OR PURULENT OPHTHALMIA.

This is the most severe and frightful form of inflammation of the conjunctiva. It is rapid in its progress, and destructive in its effects.

Symptoms.—All the symptoms enumerated in simple ophthalmia are here more intense, and the eyelids become enormously swollen, and then its characteristic discharge commences. This is a thick, yellow, sometimes greenish matter, which is poured out in considerable quantities.

I will not allude to the treatment of this dreadful affection, because immediate recourse must be had to a skilful oculist. Prompt and energetic treatment will alone preserve vision.

In certain other affections matter is sometimes conveyed to the eye by the finger or otherwise. Hence the necessity of great caution to prevent so direful a result, for the disease thus communicated is as severe and generally more destructive than Egyptian Ophthalmia, and requires fully as energetic treatment.

PURULENT OPHTHALMIA IN INFANTS.

This disease frequently attacks children in the first few days or weeks of their existence. Some swelling of the lids is observed, also a little discharge of matter, and after sleeping the lids adhere together. As these symptoms often come on without any violence the mother thinks it is "a mere cold in the eyes," and applies a little breast-milk or some simple application. This, sometimes is all that is necessary, but such cases require watching, as they may suddenly assume a violent form, then the lids become greatly tumefied, and even turned out, the discharge profuse, and if decisive remedies are not used the little sufferer will probably have both eyes destroyed. The destructive character which this disease so often assumes cannot be too generally known.

Case.—A lady called on me with her babe to ascertain if any thing could be done to restore its sight. She stated that shortly after its birth the eyes became tender and sore; this she supposed to be the effect of cold. The attendant physician prescribed a lotion; the disease gradually became worse, swelling of the eyelids, and a profuse discharge of matter took place, the result was total destruction of both eyes; one protruded between the lids, the other was completely sunk. I had only to communicate to the afflicted mother the sorrowful intelligence that vision was irreparably lost.

Two months subsequently this lady again called on me with a request that I would immediately visit the newly-born baby of an acquaintance, that was attacked as her's had been. She said she had been visiting at the house, and knowing the dreadful nature of the disease, and the necessity of prompt action,

she hastened to have immediate assistance. I at once acceded to her wishes and found the following case :

Jane B——, 194 Franklin-street, aged ten days, was attacked with inflammation in the eyes four days since, shortly after her return from being baptized at church on a very cold day. When I saw her, the lids of both eyes were enormously swollen, everted, and the lining membrane intensely red ; the discharge of matter profuse, with general uneasiness and distress. I had some difficulty in exposing the eyes for examination. On doing so, however, I found the cornea of each eye already implicated, ulceration having taken place. Energetic treatment, and strict attention, enabled me to save both eyes, but I feel assured that if this lady had not, from her own sad experience, known the danger of delay, and if active treatment had not been resorted to at the moment, the result would have been total loss of vision.

This disease being contagious, the greatest cleanliness and caution must be used to prevent the contact of any of the matter with the eyes of the attendants. Always wash the hands after dressing the affected eyes, and avoid drying them with the towel used for the child.

Inflammation of the eyes, accompanying or following small pox, measles, or scarlet fever, must be treated according to the nature of the attack, and, if severe, requires the attention of the experienced practitioner to prevent deformity or loss of vision.

GRANULAR LIDS.

In this affection the lining membrane of the lids is raised by irregular little projections, and presents a rough appearance instead of the smooth polished surface of health. It is generally the result of some long-continued inflammation, and it keeps up a constant degree of pain and irritation by the friction which is caused when the lids are moved over the eye. This produces chronic ophthalmia; opacities form on the cornea, blood-vessels shoot over it, and if the disease is not removed blindness will ensue.

Treatment.—In addition to the local applications used or operations performed by the oculist for the removal of the granulations and the prevention of the tendency which exists to their reproduction it is absolutely necessary to attend to the general state of the health. The diet must be carefully regulated and ought to be nutritious, where, as is generally the case, the patient is debilitated; change of air, exercise, tonics, the bath, protection from changes of weather, and rest or moderate use of the eye, all tend to promote the recovery and prevent a relapse.

This complaint, if neglected, becomes very intractable, and requires a lengthened course of treatment before a cure can be accomplished. Frequently the nature of the disease is not suspected by the practitioner, and this proves the necessity of a thorough examination of the inside of the lids before announcing the name and character of a disease or undertaking its treatment.

Case.—Mr. T. R——, Atlantic-street, Brooklyn, had inflamed eyes for twelve months; he was unable to attend to his business. His physician bled, cupped, leeches, and physicked

him, and prescribed various eye-waters. His constitution was greatly debilitated, without, of course, his disease being in the slightest degree mitigated. The affection could not have been understood, as the inside of the lids had never been examined, and Mr. R. himself had no idea of the existence of those granulations. Three months after he came under my charge he was enabled to resume business, and in nine months he was perfectly cured.

Case.—Mrs. B——, Bloomingdale, presented herself with granulations of the lids of the worst description. No treatment had been then adopted. In six weeks the granulations have nearly disappeared, and a manifest improvement of the eyes has taken place. I relate this case to show that the cure progresses much more rapidly if the disease has not been tampered with, and allowed to become confirmed

PTERYGIUM, FROM *πτερόν*, A WING.

This is the name of a reddish triangular substance that generally grows from the inner corner of the eye, though not always. Its point, or apex, is invariably towards or extending over the clear part of the eye, while its base is on the white of the eye. It is always triangular in shape; it may remain stationary for a considerable period, but, if it extends, it soon impairs the sight and produces nebulae on the transparent cornea, and vision is ultimately lost if the disease is not removed, to effect which an operation is generally necessary. This is accomplished in a few seconds, without pain, and the patient requires no confinement afterwards.

Case.—Mr. C——, mate of the “Celia,” embarked for Charleston two hours after I removed the Pterygia from both eyes, and assumed his duties on board. On his return he called on me and stated that he had not had the slightest trouble, and that both eyes had speedily got quite well.

INFLAMMATION OF THE SCLEROTIC COAT.

The white of the eye is sometimes attacked with inflammation, but generally in gouty or rheumatic persons. The blood-vessels have a pinky hue from their being deep seated, and the sclerotic presents a heavy leaden color. The pain is of an aching, dull character, similar to rheumatism, the patient is worse at night and easier in the morning. There is considerable irritation and fever, and great uneasiness in the different motions of the eye ball. The remedies used in rheumatism and gout, and those required in simple inflammation must be adopted.

THE CORNEA.

The Cornea, or clear part of the eye is subject to different diseases. These are very important, for if its transparency is impaired, vision is intercepted or entirely prevented.

Inflammation is sometimes communicated from the conjunctiva, or it arises in the cornea itself.

Symptoms.—The cornea loses its natural lustre and appears cloudy and smoky, is frequently covered with small ulcers, and becomes red in appearance ; in addition to which the symptoms of ordinary ophthalmia are present. This disease must be treated with great care and attention, or the eye may be lost.

Treatment.—The course to be pursued in affections of this nature is similar to that recommended in Ophthalmia or inflammation of the conjunctiva.

ULCERS OF THE CORNEA.

These are caused by the last mentioned disease, and also by mechanical or chemical substances. When the ulcers spread on the surface the transparency of the cornea is destroyed. When they proceed deeply they penetrate the eye, the aqueous humour escapes, the iris protrudes, and even the lens and vitreous humour may be discharged, completing the destruction of the entire organ.

These cases are, if skilfully attended to from the commencement, speedily and easily controlled, but if neglected, or injudiciously treated, great danger is to be apprehended.

Case.—Miss S. W——, 14 Dover-street, had an attack of inflammation of cornea of right eye. For several months she applied various eye-waters ; vision became gradually indistinct ; finally she could not see at all with the affected eye. When she was placed under my care a penetrating ulcer of the cornea existed. I was enabled to restore the eye in a short period, and the cornea returned to its original transparency. If she had

pursued the former course of treatment for a short time longer, the eye must have been inevitably lost.

Case.—Miss A. F——, 164 Essex-street, for two years labored under strumous ophthalmia. This ultimately caused several ulcers, which extended over the cornea. She was in this state when presented to me ; great intolerance of light existed, and prostration and delicacy of constitution, and a total inability to hold up her head or open the eyes. Under a proper course of treatment she has perfectly recovered. If this case had gone on a little longer vision would have been for ever obscured.

Case.—Mr. T. McN——, 154 Leonard-street, had ulcers extending over cornea. The disease commenced two weeks before he applied for relief. In ten days his eyes were perfectly cured.

Case.—Mr. C. McD——, William-street, was suffering under a penetrating ulcer of cornea ; it began six days previous to his seeking advice. and was cured in one week.

These cases are related to exhibit the necessity and advantage of early application. In the former cases long-continued sufferings were endured and complete blindness narrowly escaped ; while in the latter instances, by prompt attention, but little inconvenience was experienced, and a cure speedily accomplished.

NEBULA AND OPACITIES OR SPECKS.

Nebula, so called from the cloudy appearance of the transparent part of the eye, is occasioned by inflammations and ulcerations. Nebulæ are superficial; opacities are deep-seated and present a dense and pearl-like appearance. Either obstruct or prevent vision. To cause their removal the inflammation must be subdued and the absorbents excited; opacities must never be removed by any operation with the knife. A judicious course of treatment will entirely or partially remove them even in many cases which are pronounced incurable.

Case.—Mr. J. C——, corner of Pearl and Water-street, Brooklyn, was *completely blind for two years* from opacities. He had been, during all this period, under the care of several eminent physicians, who pronounced the case hopeless. Notwithstanding, he has now perfectly recovered, and has been enabled to attend to his occupation as a painter, without the loss of a single day for the last twelve months.

Case.—Louis S——, aged six years, son to Captain S. of the brig “Adela,” was afflicted since his infancy with opacities, which had latterly much increased, greatly obscuring vision. He had been under the care of several physicians. After two months treatment, vision was completely restored and the specks removed.

STAPHYLOMA.

From σταφυλή, A Grape.

In this disease the cornea projects between the lids in the form of a whitish, pearly, conical tumour. It originates from severe ophthalmia, and is a frequent consequence of small-

pox. The sight is totally lost. The exposure of the eye-ball to the air and dust is a constant source of irritation, and often, through sympathy, disease is produced in the sound eye. It is sometimes necessary to perform an operation to relieve the patient, and prevent the other eye from being affected. The globe will then diminish in size, so as to allow an artificial eye to be worn.

INFLAMMATION OF THE IRIS.

This disease is termed Iritis.

Symptoms.—The ordinary symptoms of inflammation are present, and in addition some that are peculiar and mark the complaint. The pupil is contracted and irregular in shape, and loses its bright black color; a thin cobweb-like substance may be perceived on looking through it. This becomes opaque, and sometimes there are pustules, and a discharge of matter takes place into the chamber of the eye. On the surface of the eye blood-vessels are observed running in straight lines towards the cornea, but suddenly disappearing when they are close to it, thereby leaving a white ring surrounding the margin of the cornea; external to which is a pink zone formed by the vessels as they penetrate the white of the eye to proceed to the Iris.

The treatment of this affection must be decisive and energetic. General and local blood-letting, the proper administration of mercury or turpentine, and the application of Belladonna, are the principle means to be relied on. The extract of Belladonna must be rubbed on the outside of the eyelids and on

the brow and temple, and some of it spread on a piece of old linen and laid over those parts. It should be frequently changed as the object of it is to keep the pupil constantly dilated, and thus prevent its fixed contraction or entire closure, or its adhesion to the lens, which is otherwise almost certain to ensue. A much more elegant application is now prepared, as recommended by Dr. Wilde, of Dublin, for the purpose of dilating the pupil, being a solution of Atropine, which alkali is the narcotic principle of Belladonna or Deadly Night-shade.

There are few diseases which have a more rapid tendency to destroy vision than Iritis. If not speedily subdued adhesions are formed between the iris and the lens; the pupil becomes immovable and contracted or obliterated, or the lens becomes opaque and the patient is blind.

Cdse.—Mr. F. T——, Church-street, was attacked with Iritis of the left eye. A physician attended him for six weeks: at the end of that time he consulted me; the pupil was then adherent, contracted and irregular, and the capsule of the lens opaque.

Case.—Mr. C. S——, 72 William-street, was attacked with violent Iritis. He immediately placed himself under my charge, and was perfectly cured in ten days.

Case.—Mr. F. S——, mate of ship "Kalio," presented himself with Iritis of three days standing, and was well in a week.

There is another species of Iritis which arises from a specific cause and requires specific treatment.

CLOSED PUPIL.

When Iritis has been neglected or not properly treated, the pupil becomes obliterated or closed. If the retina is unaffected considerable vision may be regained by forming an artificial pupil. This, however, being accomplished by an operation, does not need explanation here.

CATARACT.

From καταρράσσω, To Confound or Disturb.

When the Crystalline lens or its capsule becomes affected with opacity, the disease is termed cataract.

The Crystalline humour with its capsule is situated in the axis of the pupil, and being in its natural state perfectly transparent, the rays of light, as we have before seen, pass through it to reach the retina; but if it has lost its transparency and become opaque, the function of the eye is necessarily interrupted or entirely prevented, as the luminous rays cannot be transmitted through it to the interior of the eye-ball. Of course the degree of blindness is in proportion to the density of the obstructing medium. While the rays of light are capable of penetrating even partially through the affected lens the disease is termed an incipient cataract. In this stage the sight is only impaired, but when the opacity is such as to exclude the rays altogether, the individual being able merely to distinguish light from darkness, or at most the indistinct outlines of objects, the disease is said to be mature or complete.

Cataract is strictly a local affection, occupying but a minute portion of the organ of vision, and causing blindness without necessarily implicating any other texture.

There are three distinct species of this affection, the hard, the soft, and the capsular. Cataract is sometimes hereditary, and no age is exempt from it; generally its progress is very slow, and it mostly arises without any apparent cause, although sometimes produced by inflammation, blows and wounds of the eye.

Symptoms.—At the commencement there is a slight sense of weakness or imperfection of vision, together with a settled cloud, which serves to obscure all objects and confuse those that are minute, and these symptoms are seldom preceded by any pain or uneasiness. The apparent cloud and indistinctness continues unaltered so long as the patient remains in the same situation and degree of light, but as the opacity generally commences in the centre of the lens, he is enabled to see better towards evening or in a moderate light, or with his back to the window than otherwise, as under such circumstances the pupil is enlarged and he can see through the outer circumference or the part of the lens that still remains transparent; and from the same cause he can discern objects that are on either side better than those that are placed directly opposite to him. The flame of a candle does not appear distinct and clear as formerly, but as if surrounded with a whitish circle or vaporous halo. The individual often becomes near-sighted and concave glasses are for a time serviceable.

The mist or cloud is constantly before the eyes, objects seem enveloped in it, and vision is indistinct; then an opacity or speck can be observed in the centre of the pupil *and behind it*. The crystalline lens has lost its transparency, and the pupil instead of being jet black, presents an opaque, yellow-

ish or pearl-colored appearance. As the opacity increases, the sight becomes more dim, and vision is better in a moderate than in a strong light, of a dark than of a bright day. Finally, the disease progresses, until the patient can only distinguish light from darkness.

The exact nature and the precise part affected in cataract, whether of the lens itself, or the posterior, or anterior surface of its capsule, can now be ascertained by the beautiful *Catoptric experiment* of PURKINJE of Breslau, and this is done simply by holding a lighted candle before the eye. The demonstration depends upon the images of the candle reflected by the eye, for their number and peculiarity indicate the seat of the disease.

Fortunately for mankind this disease is susceptible of relief. We observed, when speaking of the lens, that it was the principal refractor of the eye. If, however, it becomes opaque and obstructs vision it can be displaced or entirely removed, and its loss supplied by an external substitute, namely, a double convex lens or cataract glass.

There are then three operations for the cure of cataract; one by extraction or removing the entire lens, and this is the principal; another by couching, depressing or pushing the lens out of the axis of vision; and the third and last, and safest, is by breaking up the cataract with needles. Each of these is adapted to the peculiarity of the individual case.

AMAUROSIS.

Amaurosis, derived from the Greek *ἀμαυρόω* to darken or obscure, is the term applied to a total or partial loss of vision, arising from an affection of the nervous structure of the eye.

This disease is produced by congestion, inflammation, sympathy with other organs, by debility, exposure to very bright light, over exertion of the eyes, particularly on minute objects, as sewing, engraving, reading, &c., by injuries to the eye or brain, by narcotics and intemperance, by particular articles of food, intestinal irritation, and various other causes. It is generally very slow in its progress, although at times the attack is immediate, as when caused by injury or sun-stroke.

Symptoms.—It is sometimes considerably advanced before the patient's suspicions are aroused, for it often arises without any known cause, and the eye itself presents *very little change in its appearance*. The more prominent symptoms are gradual obscurity and impairment of vision; objects at first looking misty or confused, in reading the letters are not defined, but run into each other; sometimes greater or lesser portions of objects are indistinguishable; again they are seen double; occasionally the object has to be held in a particular direction before it can be seen, and an effort is made to throw the image on a part of the retina not affected, causing Strabismus or squinting. There is an appearance of numerous insects or substances, like pieces of cobweb, interposed between the object and the eye.

The illusive appearance of dark moving spots or motes floating in the air, gradually increases, some as if flying before the eyes in greater or lesser numbers, often suddenly ascending

and as quickly descending. Sometimes the appearance of branches or hairs, or a perfect network is presented; flashes of light are evolved, vision becomes more and more indistinct, there is frequently pain, giddiness, or a sense of heaviness in the brow or temple.

The appearance of the eye is not much changed, but the pupil is mostly dilated and motionless, though sometimes it is of the usual size, or even smaller than natural, and the iris active. Amaurosis is the most complicated, and for its cure requires the most scientific treatment of all the affections to which the eye is subject.

It is, however, in the patients own power to contribute towards a cure, by adopting so far as practicable the hygiean rules and suggestions specified in the section of this Treatise that relates to the Preservation, Improvement, and Restoration of Vision. Indeed, without a careful pursuance of such a course on his part, all the efforts of the oculist, however well directed, may be entirely fruitless.

It behoves all persons to be prompt in seeking advice when they perceive any of the earlier symptoms or indications of this disease. When the eyes are easily fatigued in reading or sewing, so that after application for a little time one cannot distinctly see the letters or work, without stopping or frequently closing the eye-lids to refresh the sight as it were. When floating black spots, or motes, or hairs, are observed constantly before the eyes, it is time to be warned. Amaurosis is much more easily checked at this early period than in its more advanced state. If the eyes become suddenly completely amaurotic, or blind, from injury or exposure, they are often more under control than old neglected cases, because they attract and receive immediate attention.

Case.—Mr. R——, superintendent of an extensive iron-foundry in this city, after looking at a large mass of molten iron, suddenly discovered that he completely lost the sight of his left eye, which was the one he had particularly directed to the burning liquid. For three weeks he suffered considerable uneasiness, and a deep-seated pain in the eye-ball. He then came under my care. The uneasiness and all the other symptoms were speedily subdued, and vision is now being steadily restored after two months treatment.

Case.—Mr. McL——, 3 Hanover street, suffered from Amaurosis for six months before he consulted me. He could not read for any length of time, especially with candle light; had a heavy dull pain in the eyes and brow, and was continually annoyed with floating specks moving in all directions before his eyes. He assiduously pursued the course of treatment suggested for four months, at the termination of which period his eyes were completely restored to their natural state.

Case.—Mr. H. L——, 278 Water-street, had an attack of Amaurosis during a voyage to China and back. Vision was imperfect, and all the other symptoms present. On his return he consulted me; in three months one eye was entirely restored, the other much improved. Here, we observe, it took a much longer period to subdue the disease in the two latter cases than in the former one, although in these the blindness was only partial, while in the former it was complete.

The eye-ball is also subject to other diseases, and to some that are truly frightful, as *Fungus Hæmatodes*, or bleeding fungus and *Cancer*. It is needless to relate the symptoms or treatment of those deplorable complaints.

AFFECTIONS OF THE EYELIDS.

The eyelids are subject to different diseases, which not only are troublesome in themselves, but frequently cause serious injury to the eye itself, even to the total loss of vision.

PSOROPHTHALMIA.

This is an inflammation of the Tarsus, forming the lid ; the conjunctiva lining the lid, the meibomian glands and the roots of the eye-lashes are generally all implicated.

Causes.—Some persons have a peculiar susceptibility for this affection ; it also often occurs after measles and the other diseases incidental to childhood ; is caused by exposure to cold or heat, and by artificial light.

Symptoms.—There is an itching sensation in the eye-lids, and a discharge of glutinous matter, which causes the lids to adhere after remaining in contact during sleep. Light is sometimes disagreeable, the eyes are suffused with tears, and the lids present a red unpleasant appearance.

Treatment.—Apply the simple remedies suggested in chronic ophthalmia. If the disease does not yield to this treatment, professional advice must be sought.

TRICHIASIS.

From θρίξ, The Hair.

This is the term applied where the *Cilia* or eye-lashes have a tendency to grow in towards the ball of the eye. This affection causes considerable irritation and inflammation of the eye. If this peculiarity is slight extraction of the inverted hairs may be sufficient for its removal; but if it recurs surgical assistance will then be necessary.

ENTROPIUM.

From ἐντρέπω, to turn in.

This is a turning in of either eye-lid, but the lower is most frequently affected. It produces a much greater degree of irritation and inflammation than Trichiasis, or the simple growing in of the hair, often causing extensive opacities of the cornea, and thereby producing total blindness. This is a disease that can be treated only by the surgeon.

ECTROPIUM.

From ἐκτρέπω to turn out.

This affection is exactly the reverse of the last described, the eye-lid being turned outwards, but as in the former case, the lower lid is the one most frequently affected; it presents a very hideous and unpleasant aspect and must receive scientific treatment for its removal.

HORDEOLUM.

This, which is commonly termed *stye*, is a little tumour near the edge of the eye-lid, which usually comes to a head, and is generally very painful. If not far advanced, and there be a probability of putting it back, an aperient and a cold lotion will be the most likely means to accomplish this end.

If matter is forming in it, warm applications and poultices are the proper means to be used.

There are also various other small tumours formed in the eye-lids which frequently require surgical assistance.

NÆVI MATERNI.

Mother's spots, congenital marks or stains, attributed to fright or the imagination of the mother. There are various methods of removing those unsightly affections; the ophthalmic surgeon will decide what is appropriate in each particular case.

PTOSIS.

From πτω, to fall down.

When the eye-lid hangs down over the eye, the disease is called Ptoxis. This drooping of the upper lid is caused by a

relaxation or redundancy of the skin, or by a paralysis of the muscle that elevates the lid. It must be treated according to its origin. In the former case an operation is generally requisite; in the latter, bathing the parts with cold water, rubbing the eyelids and brow with a stimulating application, together with the shower-bath and tonics, are the simplest means to restore the tone of the parts.

FISTULA LACHRYMALIS,

Or stoppage of the tear-passage, is caused by a thickening or slight obstruction of the tear-passage, which prevents the tears passing readily into the nose; the eye presents a watery appearance, especially when exposed to the wind or cold, and the tears run over the cheek. Stoppage of the tear-passage, even in this early stage of the disease, is a very unpleasant affection.

In a more advanced stage of this disease there is a swelling near the inner angle of the eye, and at the root of the nose, accompanied by pain and redness: this sometimes subsides when proper means have been resorted to; at other times it terminates by forming matter; this is either evacuated by an operation, or bursts of its own accord, and the tumour diminishes, often times leaving a permanent obstruction of the tear-passage, and continuing a discharge of matter through the little tear opening; occasionally it leaves a fistulous opening in the skin through which the matter and tears are discharged. Frequent attacks of inflammation recur, with a repetition of all the symptoms before enumerated. These cases are very distressing to the patient and require skill and experience on the part of the practitioner for their management.

Treatment.—If acute inflammation exists leeches should be

applied near the inner corner of the eye and afterwards either warm fomentations or cold lotions, according to the feelings of the patient. The Antiphlogistic regimen must be adopted, and gentle laxatives prescribed. If the affection has become chronic we must endeavour to improve the mucous membrane of the tear passages by the use of astringent lotions and the state of the entire system by attention to diet, regular exercise, change of air, and, when required, occasional laxatives, alteratives, or tonics. The patient should frequently empty the sac towards the nose, by pressing with the finger at the inner angle of the eye. If, however, the disease is so far advanced as to be beyond the control of those or other remedial agents, it then becomes necessary for the oculist to introduce a *style* in order to allow the tears a free passage into the nose.

STRABISMUS—SQUINTING,

Or cross eyes, is an affection so apparent, as to require but little explanation.

The eye may be directed upwards, downwards, externally, or towards the nose, and this latter is the most frequent deformity. This affection is attributed to various causes, as measles, and all the diseases of children, falls or blows, the custom of looking at the nose, the position in which the baby has lain in the cradle, teething, worms, or indigestion, imitating others that have been so afflicted, opacities of the cornea, want of sensibility of parts of the retina, water or pressure on the brain, fits, &c., &c.

Occasionally it is remittent in its character, the eyes at times being straight and again crooked. It is therefore necessary to

ascertain the origin of each affection before commencing its treatment. Many cases of Strabismus arising from some of the above causes, are perfectly under the control of judicious medical treatment, but in some cases that cannot be relieved by those means, varied mechanical contrivances have been tried with, however, but little success.

We now come to speak of one of the triumphs of modern surgery, the operation for the cure of strabismus, first discovered by Diffenbach, of Vienna, and since performed on thousands of patients both in Europe and in this country with greater success and safety than probably any other operation in the whole range of ophthalmic surgery. The operation is trifling in itself, although important in its results, is attended with little or no pain, sometimes with scarcely the loss of one drop of blood, and is accomplished in a few seconds.

The operation consists in dividing the contracted muscle which confines the eye in a wrong direction. This operation ought only to be performed by the experienced oculist, as the worst consequences may be caused by a bungling operator. The successful operation not only restores the eye to its proper position, but also causes a great improvement of vision, inasmuch as the axis of the eyes becomes symmetrical.

Squinting certainly produces an unpleasant sinister expression of countenance, for we "outer barbarians," have not yet arrived at the civilization of the inhabitants of the Celestial Empire, who, with a peculiar obliquity of taste, prefer the slanting eye to the straight. Descartes, too, the great philosopher, preferred persons with a squint; this fancy is said to have originated from his having been in love with a lady in his earlier days who possessed this peculiarity.

Most frequently, however, such a defect is very detrimental to the business prospects and happiness of individuals.

Case.—Mr. H. F——, 72 Front-street, a young gentleman from the West, stated that in consequence of this unpleasant deformity he was unable to obtain a situation. I operated on him; his eyes became perfectly straight, and he afterwards got employment without difficulty.

Case.—Miss E. C——'s, ——, case was precisely similar to the last; both with regard to difficulty of procuring a situation before the operation and subsequent success.

INJURIES AND ACCIDENTS.

The eye is subject to various accidents from mechanical and chemical causes. Among the former may be enumerated injuries from dust, sand, insects, rail-road sparks, emory, steel, iron-filings, chips of wood and stone, explosion of detonating-caps, bursting of soda-water bottles, and from many other substances which are frequently driven with great force into the eye.

Chemical injuries are produced by lime, fused metals, scalding water, concentrated acids, and such like, coming in contact with the eye.

When a foreign substance is propelled into the eye, however minute the particle, it causes considerable uneasiness; the tears flow copiously as if to wash away the irritating substance, the eye becomes bloodshot and painful, particularly if the particle is beneath the upper eye-lid, because this is denser and more bound down on the eye than the other, and the constant motion of the eye-lid, in winking and moving over the eye, causes by its friction great distress.

If the substance is not sharp, and has not been propelled

with much force, it is in general easily removed, particularly if not under the upper eye-lid, with the finger or by means of a camel's hair pencil; but sharp particles driven against the eye with great force, often penetrate the conjunctiva, or the cornea, and require to be skilfully removed, as they are very liable to be driven further in by clumsy attempts for their extraction. If inflammation should occur, or have already been excited, recourse must be had to the usual remedies in such cases.

When the eye has been injured or wounded more extensively, the best plan is simply to close the eye-lids, and retain them in this position by means of a strip or two of adhesive or court-plaister, until further advice can be obtained.

Injuries resulting from lime or mortar require the speedy removal of the offending substance; and as in cases where scalding water has been the cause of injury, oil should be introduced between the lids. It is surprising what a severe injury may be sometimes inflicted on the eye, and yet with care the organ be preserved.

Case.—Mr. H. D——, 150 Fulton-street, had the entire front of his eye lacerated by the bursting of a soda-water bottle, the cornea being cut completely across so that the aqueous humour ran out, and yet I was enabled to preserve the eye and restore vision.

Case.—Master A. W——, Brooklyn, had his eye cut entirely open with a pen-knife, his brother's hand slipping while cutting mint in the garden, and suddenly striking up with considerable force. He was promptly brought to me and his eye has been saved.

Case.—Mr. T. T——, Canal-street, had scalding water thrown in his eyes. I was immediately called to see him and was successful in preventing any unpleasant result.

ECCHYMOSIS OR BLACK EYE.

This, which in armorial parlance, has been designated the "rowdy's coat of arms," is a misfortune that the most dignified are not exempt from. An accidental blow, a leech-bite, or the sting of an insect, will cause it.

Treatment.—The object is to prevent the effusion of blood as much as possible, therefore cold applications should be constantly and freely applied when the accident first occurs. I do not think the application of leeches necessary or beneficial, unless inflammation is present; they will not prevent the blackness, and they frequently cause it: to hasten the removal of the blackness, an ointment of the hydriodate of potass, in the proportion of ten grains to one ounce of hog's-lard, may be used, or an infusion of arnica flowers and rosemary, two drachms of each to half a pint of wine, may be applied. If there is much effusion of blood it should be evacuated with a lancet.

BITES OF MOSQUITOES OR OTHER INSECTS

Sometimes create considerable swelling and inflammation of the eye-lids, completely closing the eyes and rendering it impossible to open them without causing a good deal of pain.

Treatment.—If the sting of the insect still remains in the wound it should be carefully extracted. Bathe the part with spirits of camphor, or a solution of brandy and salt; and afterwards, if necessary, a cold lotion may be applied.

ARTIFICIAL EYES.

Those persons who have unfortunately lost an eye, will experience great comfort and advantage in having an artificial eye inserted.

These beautiful imitations of the natural eye are constructed of enamel; in front they assume the form and appearance of the eye, and being only a shell hollow behind, fit over the remains of the lost eye.

There is a great difference in the quality and finish of artificial eyes. Some are positively superb gems of art, their manufacture having reached the highest degree of perfection. The colors of the iris are beautifully depicted, and the shape and brilliancy of the cornea is admirable. The closest observer can seldom detect them, particularly as they move with precision and in accordance with the natural eye, for the stump or lost eye may be observed to change its direction in correspondence with the sound eye, as its muscles are still perfect, and the artificial substitute accurately fitting over the stump its motions are communicated to it; in addition to which it receives a fur-

ther impulse from the folds of the conjunctiva and the eyelids, and is thus enabled to move in conformity with the unaffected eye.

Artificial eyes are not only useful in improving the appearance and expression of the entire countenance, they also protect the cavity from dust or extraneous matter, exclude the cold air, support the lids and prevent their wasting and closing. They thus render essential service to the healthy eye which otherwise often suffers by sympathy with the exposed socket.

The method of introducing and removing them is quite simple and is effected without an operation or the slightest pain.

If there be great sensibility or irritation about the cavity it is necessary to use some means to remove these before inserting the eye. A smaller one may be used at first and the size gradually increased.

The artificial eye should be withdrawn at night, carefully washed and put up in a box containing cotton. In winter tepid water ought to be used, as the sudden transition from the warm socket to cold water might injure it. The socket itself should be bathed with cold water after the removal of the eye at night and previous to its introduction in the morning.

It is really astonishing the profound, and in some quarters culpable ignorance that exists respecting the eyes. The reader has ascertained, from the description which I have just given of the artificial eye, that it depends on the sunk eye for its support and motion, and he will be horrified to learn that a physician extirpated the remains of an eye to prepare the patient, as he said, for an artificial one; not alone subjecting the unfortu-

nate person to so severe an operation, but utterly precluding the possibility of his ever after wearing one.

† This occurrence it is really shocking to think of. The following case, which is related in a Parisian journal, and its attendant circumstances, are highly ludicrous :—

A curious cause has just come before the Juge de Paix of Neuilly. Some time ago, Madame Pluyette, a widow lady of 50, but who still attaches much importance to personal appearance, had the misfortune, in playing with a lap-dog, to receive from it so severe a wound in one of her eyes, as to entirely destroy it. Having heard much of artificial eyes, and being recommended to apply to an expert manufacturer in this way, named Tamisier, she gave an order for one, for which M. Tamisier charged her 100f. Refusing to pay this charge the manufacturer summoned her before the Juge de Paix. Madame Pluyette having appeared, holding the artificial eye in her hand, the Juge de Paix asked her why she refused to pay the bill which M. Tamisier had sent in ?

“ For a very good reason,” replied the defendant, “ I can see no more with it than I could before.”

“ What !” exclaimed the Juge de Paix, “ did you really imagine that you would be able to see with an artificial eye ?”

“ Did I think so ?” retorted the angry dame—“ Certainly I did. Will you be so good as to tell me what eyes are for, but to see with ? I ordered the eye for use, and until M. Tamisier makes me one with which I can see, I will not pay him a sou. I wear a wig, which is quite as useful as natural hair ; I have three false teeth, which answer as well as those which I have lost ; and why should I pay for an eye which is of no use ?”

The Juge de Paix endeavored to convince Madame Pluyette that artificial eyes were for others to look at, and not for the wearer to look from them; but finding all appeals to her reason of no avail, he condemned her to pay the plaintiff the amount of his demand.

When the defendant heard the decision, she became furious with anger, and after dashing her artificial eye on the floor, she rushed out of court amid the laughter of the crowd.

ADVICE TO PATIENTS.

Patients ought to be very particular where they procure their medical preparations, as they are frequently adulterated and rendered entirely inert. The oculist who has his patients' welfare in view, and his own reputation at stake, ought to be particular with regard to the strictly pure and genuine quality of his medicines, and should not disdain himself to perform the necessary pharmaceutical manipulations for their preparation.

In other branches of science no one considers it degrading that the experimenter should prepare his own apparatus. Sir Isaac Newton ground his own glasses. Sir William Herschell made his own telescopes. Sir John Herschell blackens his fingers with nitrate of silver, which he dissolves for the sake of studying the chemical action of the rays of light. Mr. Faraday cuts out and gilds pith balls to serve as electrometers, and pastes on glass slips of tinfoil to act as conductors of electricity. The Earl of Rosse did not disdain to take a share in the manual

labor of casting and grinding his monster spectrum. Neither of these great men has thought it beneath his dignity to stoop to the work of a turner, a wire-drawer, a smith, a glass-blower, or an operative chemist; or that he tarnished his scientific reputation by soiling his hands, his face, or his hair, with dust, smoke, acids, or filings, for the sake of insuring the eventual success of any scientific experiment in which he was engaged. On the contrary, the labor they have bestowed on their apparatus is universally recognized as one of their claims for respect. In the *medical profession*, on the other hand, the false standard of dignity which has been established, enables the man who merely writes out on a slip of paper a prescription for his patient, and trusts its composition to the hap-hazard of a druggist's doubtful stock and careless apprentice, to regard with contempt any fellow-laborer in the cause of humanity, who, in a precisely similar case, writes out the same prescription in a book, and then either makes it up himself, or has it made up by one whom he has taught, and on whose accuracy he can rely, from drugs which he has been most careful to procure genuine.

In concluding this part of my subject, I would earnestly impress the necessity of early attention so soon as the first symptoms of any affection of the eyes are perceived by the patient, as the very worst consequences may, and frequently do result from delay

" Sero medicina paratur,
Cum, mala, per longas convaluere moras."

The eye is far too delicate and precious an organ to be trifled with, or made the subject of random experiments, and therefore it would be exceedingly unwise, and perhaps dangerous, to accept any of the thousand remedies which are tendered by the mistaken kindness of all around, for every one offers a specific for diseases of the eye.

The reader, who has thus far accompanied me, can perceive the diversity and importance of the various affections to which the eye is liable, and can readily understand the inutility and hazard of relying on boasted eye-waters and balsams; for as the textures of the eye and its diseases differ, so also must the treatment vary and be adapted to each particular case and to the different stages of the same affection.

How much more rational to consult an experienced oculist, who thoroughly understands every disease of this tender organ in all its aspects and varieties.

I cannot too strongly reprobate the practice that obtains, even amongst the faculty, particularly at some public institutions, of treating every case alike, not investigating the circumstances and peculiarities of each, but blindly adopting and following theories, sometimes the most erroneous.

Patients are constantly presenting themselves with chronic cases, and on enquiring what has been previously done for them, the almost invariable reply is, "I was bled and blistered, then cupped two or three times a week, had a pill at night, and salts in the morning;" this, too, from the young and the old, the weak and the robust. Patients come to seek advice after such a course, with constitutions broken down and exhausted, with minds depressed and diseases not amended, but aggravated. And is this to be wondered at, when there is no fact better ascertained than that debility, impoverished blood, or insufficient nourishment, are in themselves frequent causes of diseases of the eye?

The beneficial effects of bleeding and cupping, in the early or inflammatory affections of the eye, are indisputable, but no practice can in general be more decidedly injurious in the advanced or chronic stages of the same affections.

From whatever cause this debility may arise, our first object must be to strengthen and invigorate the shattered constitution before we can attempt to make a favorable impression on the disease.

Finally, I would remind the patient of the absolute importance of co-operation on his own part, in faithfully carrying out the views and observing the instructions of his professional adviser as regards medicine, regimen, and whatever else may be suggested in the treatment of his case.

PRESERVATION AND IMPROVEMENT OF VISION,

WITH OBSERVATIONS ON THE

PREVENTION OF DISEASES OF THE EYE.

The suggestions which I am about to make relative to the *preservation*, are equally applicable to the *improvement* of vision, and to the *prevention* of disease; they are therefore all included in this section.

The full enjoyment of

“Happiness, our being’s end and aim.”

is so essentially dependant on perfect and unimpaired vision, that every observation which contributes to preserve or improve the eye ought to be written in letters of gold and indelibly impressed on the tablet of the memory, for blindness is one of the most bitter ingredients which can be mingled in the cup of

human suffering. How touchingly has MILTON depicted his melancholy condition under this sad privation :

“ With the year

Seasons return : but not to me returns
 Day, or the sweet approach of even or morn,
 Or sight of vernal bloom, or summer's rose,
 Or flocks, or herds, or human face divine ;
 But cloud instead, and ever-during dark
 Surrounds me, from the cheerful ways of men
 Cut off, and for the book of knowledge fair
 Presented with an universal blank
 Of nature's works, to me expunged and razed,
 And wisdom, at one entrance, quite shut out.

It cannot be too clearly understood that the influence of the mind, the general health of the system, constitutional causes, the state of the blood, stomach and digestive powers, have an intimate and important bearing on the condition and well-being of the organs of vision.

To preserve the “*mens sana in corpore sano*,” a sound mind in a sound body, is then a matter of the first consequence. We will therefore suggest what we deem most likely to accomplish so desirable a purpose.

TEMPERANCE.

The first great rule is temperance in all things. I need scarcely enumerate the train of ill consequences attendant on drunkenness, at such a tale as this even death himself *grins horribly a ghastly smile*. Death lies concealed in the tankard that waits beside the drunkard ; and death has taken up his abode in the glass that sparkles in the hand of the dram drinker. And if some persons will be so fool-hardy as to devour death, they must abide the dreadful consequences. The in-

temperate not only, however, shorten their own days, but by transmitting a morbid stamina to their descendants subject them to disease and untimely dissolution.

Alcohol, when taken into the stomach, is absorbed and gets into the circulating system; a portion of it escapes by the lungs and is recognised by its odor in the breath. Liebeg asserts that it is burnt in the lungs and thereby converted into carbonic acid and water. Alcohol, therefore, is a fuel in the animal economy, by the combustion of which caloric is evolved, but it is a most obnoxious and dangerous fuel. Its volatility and the facility with which it permeates membranes and tissues enables it to be rapidly absorbed, and when it gets into the blood it exerts a most injurious operation on the brain and the liver.

But if temperance is desirable for the general benefit of the system, it is eminently so with regard to the organs of vision, for no where are the effects of intemperance more strongly marked than in the eyes, from the period when the sometime inebriate sees all objects double, to that of the red and bleared eyes of the confirmed and habitual drunkard.

REGULAR HOURS.

" Early to bed and early to rise,
Makes a man healthy, wealthy, and wise.

may be a trite, but is a very true adage. To retire at a proper hour, rest a sufficient period, and rise betimes, produces a salutary influence on the delicate eye; but he who converts night into day, sitting up in crowded and badly ventilated apart-

ments, surrounded, perhaps, by glaring lights, will probably soon perceive the red and weakened appearance presented by this sensitive organ, and thus be admonished of the injury he is inflicting on it.

Retiring early to rest, breathing a free air in the night, without the interruption of bed curtains; rising early in the morning as soon as nature is refreshed, and getting out, if possible, into the country, or outskirts of the town to inhale the pure air, contributes to give elasticity to the springs of life and renovates the entire system. Nothing is more weakening than the habit of laying in bed after nature has been refreshed by invigorating sleep.

The following extract from the Journal of the celebrated Elizabeth Woodville, afterwards married to Lord Grey, and subsequently Queen to Edward IV. which was extracted from an ancient manuscript, preserved in Drummond Castle, may surprise, amuse, and perhaps profit some of my young readers :

Monday Morning.—Rose at *four o'clock*, and helped Catherine to milk the cows; Rachel, the other dairy-maid, having scalded her hand in so bad a manner the night before. Made a poultice for Rachel, and gave Robin a penny to get something from the apothecary.

Six o'clock.—The buttock of beef too much boiled, and beer a little of the stalest. Mem. To talk with the cook about the first fault, and to mend the second myself by tapping a fresh barrel directly.

Seven.—Went to walk with the lady my mother in the court-yard, fed 25 men and women; chid Roger severely for expressing some ill will at attending us with the broken-meat.

Eight.—Went into the paddock behind the house with my

maid Dorothy; caught *Thump*, the little poney, myself, and rode a matter of six miles without saddle or bridle.

Ten.—Went to dinner.

Eleven.—Rose from the table, the company all desirous of walking into the fields. John Grey would lift me over every stile.

Three.—Poor farmer Robinson's house burnt down by accidental fire; John Grey proposed a subscription among the company, and gave no less than four pounds with this benevolent intent. Mem. Never saw him look so comely as at that moment.

Four.—Went to prayers.

Six.—Fed the hogs and poultry.

Seven.—Supper on the table; *delayed* till that hour on account of farmer Robinson's misfortune.

Nine.—The company fast asleep. These *late* hours very disagreeable!

CLOTHING.

Comfortable and sufficient clothing, adapted to the seasons, is of vast importance, especially to children and aged persons. It is a very mistaken notion to endeavor to make children hardy by exposing them to cold, or depriving them of warm clothing. Such a course is much more likely to engender

disease than to promote health. Above all things it is necessary to keep the feet dry and warm. Damp feet are a prolific source of many of the various ailments to which the eyes are liable.

Clothing in itself has not the power of communicating warmth, it prevents the escape of the natural caloric of the body, and thus a stratum of warm air is retained between the clothes and the body. This explains the cause of loose garments being warmer than tight ones, because the loose dress, if closed at its upper and lower part, encloses a thin stratum of warm air which the tight one cannot. Every extra article of clothing which we put on creates an additional layer of warm air, the outer layer being cooler than the inner; therefore when we are about to go out into the cold air, we ought to put on our outside garments a little before leaving the warm room, so as to heat the outer layer of air, as otherwise the heat will be withdrawn from the body itself. The materials used for clothing should be bad conductors of heat and of sufficient permeability to allow free transpiration of the skin. Woollen and silken articles of attire cause in some persons of sensitive skin cutaneous irritation and even eruptions. Linen is very agreeable next the skin, but it absorbs the perspiration, and instead of the stratum of dry air, there is one of moisture, and this being a good conductor of heat, rapidly chills the body. Cotton, though not so pleasant to the skin, is preferred in warm weather, as it does not absorb moisture to the same extent as linen.

Great attention should be paid to frequently exchanging foul linen and flannels for those that are cleanly washed and well dried, and this part of advice respects both body and bed-clothes. Nothing renders clothes purer or sweeter than good country washing and bleaching. It would not be an excess of cleanliness but tend greatly to the preservation of health, if in

addition to the rule of never using the same inner garments by day and night, those persons who wear flannel vests would change them every day. This may be done without much trouble or expense, by having two vests in use at the same time, and wearing them alternately, hanging up the one that was last worn to air during the time it remains unused.

So much has been said and written relative to the injurious effects of tight clothes, especially the deformity-creating corset, that I will add nothing more than to protest against folly so absurd. I believe most persons now understand the misery that those instruments of torture entail to the third and fourth generation; but so despotic is the empire of fashion that they kiss the tyrant hand which smites them.

“ They know the right, and they approve it too,
Condemn the wrong, and yet the wrong pursue !”

With regard to colors, it is very important that persons who have a tendency to weakness of the sight should select those of soft and refreshing hues, and not such as reflect the bright and heating rays.

Ladies' bonnets, under such circumstances, should be blue, green, grey, or black, particularly the lining. Bright and glaring flowers, or ribbons, on the inside of the bonnet are very trying to the eyes, as well as similar colors in parasols, sunshades and fans. Veils are decidedly objectionable, they prevent the free circulation of air, and from their constant waving to and fro vision is rendered confused and indistinct.

THE BATH.

Next is the cardinal virtue of cleanliness and frequent ablutions of the entire person. Water conduces, in an eminent degree, to health and happiness. A bath every morning in the year, of warm or cold water, the latter if the constitution is not too feeble, will be found the best preservative against colds and inflammations of the eyes. The temperature of the water ought to be regulated by the feelings of the individual. The great test of its benefit is if after the bath a delightful glow is felt to pervade the whole body.

We know that in a state of health insensible perspiration is continually taking place. We are told that each cuticular pore that exhales this secretion has a little tube attached to it of about a quarter of an inch in length, and that there are 3,258 of these in a square inch on the palm of the hand or a length of tube equal to 73 1-2 feet. But even estimating the number of pores in each at 2,800, and calculating the number of square inches of surface in an ordinary sized man at 2,500, it follows that if these little tubes were extended out in a continuous line, they would reach the enormous length of 28 miles! And it has been calculated that eight grains in weight of perspiration are exhaled by the skin through these pores in the course of a minute.

We also know that the outer or scarf skin is constantly thrown off from the body in the shape of small powdery scales. These become mixed with the unctuous and saline products of the skin, and when united together they form a thin pellicle to which dust and dirt adhere. This concretion blocks up the pores, prevents free transpiration, irritates the skin, and keeps it damp and cold. The insensible perspiration being thus checked in its egress, the destructive fluids and impurities which ought to pass off in this way are again taken up into the system, giving origin to various maladies of the different organs and tissues, and this is oftener than is generally supposed the cause of diseases in the eye.

The skin likewise performs in the animal economy an important part as a respiratory apparatus; but if the pores are stopped by these accumulated secretions, the blood cannot be oxidized on the surface of the body by the air, neither can it here discharge its carbon, thus suspending or annulling over so great an extent of surface a function of such vital importance.

The incrustation is, also, a nucleous, where miasma and infectious matter may lodge until it is absorbed into the system, producing not unfrequently death and destruction.

Surely no argument is necessary after this statement of facts to enforce the absolute necessity of the bath, for this effectually removes incrustations, frees the pores from obstructions, and by its habitual use we are enabled at all times to secure a free transit to the natural exhalation, promote a copious discharge of insensible perspiration, prevent the blood from being poisoned by the re-absorption of impurities, and essentially add to the health and happiness of the individual. Those that have used this salutary process for any time could not easily be induced to relinquish a practice that tends to render the body indurate against cold, and is fraught with so many other ad-

vantages. In fact nothing is more refreshing or luxurious after fatigue and exhaustion than the bath, or more speedily revives and restores the drooping energies, exhilarating the spirits and giving renewed tone and vigor to the entire system.

The shower bath possesses in some cases many advantages, and from its portability and general utility is fast becoming a *sine qua non* in every dwelling. The gentle shock to the nervous system, and the concussion of the skin, caused by the fall of the water, produces a highly salutary effect. Reaction quickly follows the first sensation of cold, for this is speedily succeeded by an agreeable feeling of warmth. The shower bath is particularly useful in diminishing the sensibility of the skin to the impressions of our changeful climate. But this, like all other baths, ought not to be used violently, that is to say, the shock ought not to be too severe either in quantity or temperature. A gradual course of training from tepid to cold is obviously the most prudent method. Some invalids bear the cold shower bath much better by having their feet immersed in warm water while taking the shower.

Many persons having asked my opinion relative to the merits of the various shower baths now before the public, I took particular pains to examine the peculiarities of each. The result is that I most decidedly give the preference to "LOCKE'S PATENT" (31 Ann street) I unhesitatingly recommend it as the *ne plus ultra* of baths. It combines economy, durability, simplicity and portability, and superadded to those requisites are some remarkable advantages. It can be used as a Douche, vapor, or hip bath, and, also, it may be said to obviate the necessity of the cumbersome bathing tub. At my suggestion Mr. Locke has further added to its usefulness by having a fine tube connected with the reservoir, and in this way a beautiful jet of water is formed which answers an excellent purpose as an eye fountain. Locke's shower bath is the best that has yet

been invented for enabling the beginner to undergo the gradual course of training that I before alluded to, as he can control the quantity of water and the elevation from which it falls.

The cold plunge bath is somewhat similar in its effects to the shower bath, but not always so efficacious.

The Douse or Douche-bath, is a contrivance for applying water locally, and combining with effusion more or less concussion of the skin. As the remedy for local disease, this form of bath has been used from time immemorial. A jug of water poured from a height on a part of the body is a Douche-bath, and a more complete one is a stream from a pump—the popular treatment for a sprain. No embrocation, lotion, or other remedy is as effectual in such cases as cold water thus applied. The concussion of the skin caused by the blow of the water against the surface is a feature of importance in this form of bath, and where a sufficient height of column or force could not be obtained the blow has sometimes been applied artificially by a little wooden hammer with which the skin is beaten as the water falls.

The jet of water, or the Douche-bath, is one of the most invaluable and appropriate remedies that can be used for strengthening and preserving the visual organs. Through all time water has been highly esteemed as the most useful and natural agent in various infirmities of the eyes, but in no way is its application so beneficial and invigorating as when a continuous shower is allowed to play on the *closed eye* and surrounding parts for five or ten minutes at a time.

I have succeeded in constructing a self-acting Eye Fountain, on simple hydrostatic principles. In this little machine, by means of pneumatic pressure, a considerable impetus is given to the water. The only trouble required before commencing

its use is to charge it with pure water, either warm or cold, or with rose water, which is sometimes agreeable and proper; then hold the flexible tube opposite the *closed eye*, turn the stopcock, and a fine continuous shower or stream issues from the pipe, which may be caused to strike against the outside of the eyelids, and the brow and temple, with increased or diminished force as required, this being regulated by turning the faucet. The Fountain is exceedingly simple in its mechanism, and not liable to get out of order.

The disputed point as to whether the application of water to the open eye is beneficial or otherwise, is, I think, very plainly solved by nature herself; for in this, as in many other Hygean rules, we must be governed by individual idiosyncrasy or peculiarity. Many persons make it a daily practice to bathe their open eyes in a basin of water every morning, which strengthens and preserves their vision. In others, of sensitive eye or constitution, water, thus applied, would be too powerful a stimulant, and prove not only injurious but, perhaps, destructive to the sight. So also with regard to the temperature of the water, to some, water at its lowest temperature would be appropriate and refreshing, while to others such a degree of cold would be not only painful but absolutely hurtful. In all cases we must appeal to our judgment and experience; and, as I have elsewhere remarked, the feelings of the individual and the effects produced by such applications, are the surest and most unerring guides.

Whatever discussion may arise as to the effects of water applied to the open or naked eye, there can be no question as to the great and unqualified advantage of its application externally, that is to say, to the integuments of the eye-lids and the adjacent parts, by means of the Self-Acting Eye Fountain, in a continuous and modified, but soothing stream, for it occa-

PRESERVATION AND IMPROVEMENT OF VISION.

sions neither contusion, chilliness, nor the slightest uneasiness, but on the contrary, a refreshing and invigorating coolness, speedily followed by an agreeable glow, which imparts animation to the countenance and increased energy to the visual, as well as muscular powers of the organ. The apparatus will be found eminently serviceable, not only to ladies who are in the habit of devoting a large portion of their evenings to reading, drawing, or fine needlework, but, also, to every description of artists, artizans and mechanics, such as miniature painters, engravers, watchmakers, jewellers, embroiderers, sempstresses, and all other persons whose avocations protracted frequently to late hours, compel them to long-continued inspection of delicate, shining, or diminutive objects under the stimulating and exhausting influence of gas or other strong and reflected light.

Whenever the eyes, in consequence of such unintermittent and inordinate exertions experience a sensation of heat, weakness, and tensive uneasiness, accompanied with unsteady and confused vision, the eye-fountain affords *immediate relief*, and, by removing the inflammatory and relaxed condition of the organ prevents that impairment or total loss of sight, in which these symptoms, if neglected or improperly treated, are otherwise apt to terminate.

The eye-fountain constitutes likewise a valuable and ornamental appendage to the dressing-room; the use of which for a few minutes *before* encountering boisterous winds, cold night air, or those atmospheric changes inseparable from attendance, in the evening at the houses of legislature or congress, at chapels, lectures, theatres or other places of public amusement, proves a ready and agreeable *preservative* against the occurrence of a suffused, watery and painful state of the eyes, and occasionally worse functional derangements, which, without its assistance, such exposure is liable to induce.

The plain vapor and medicated vapor bath are excellent remedial measures in particular affections. By means of the latter the volatile principles of various medicinal substances can be introduced into the system. A cheap substitute for the vapor bath has recently been recommended. Take a piece of quick-lime about half the size of the hand, wrap around it a wet cloth sufficiently wrung to prevent water running from it, wrap a dry cloth several times around this; prepare a second one in the same way: place one of the packets on each side of the patient when in bed. An abundant humid heat is soon developed by the combination of the lime with the water, which quickly induces copious transpiration. The effect will last for two hours at least. When perspiration is fully established withdraw the lime which is now reduced to powder.

With regard to temperature we must be governed in each instance by the nature of the case, the peculiarities of the patient and the particular effect we are desirous of accomplishing. The temperate and the tepid bath produce a quieting or sedative effect on the system. The hot bath stimulates, and the warm bath has an intermediate action. The range of the several baths is by Fahrenheit's thermometer, as follows:

Temperate.....	from 75° to 80°
Tepid.....	from 85° to 95°
Warm.....	from 95° to 98°
Hot.....	from 98° to 105°

The free use of soap to remove the accumulated oily matter secreted by the skin is absolutely requisite.

After the bath, whatever it may have been, the body must be thoroughly dried and rubbed with a coarse towel until a genial glow is diffused over the entire person.

Friction with the horse-hair gloves or straps will also be found singularly advantageous in determining the blood to the surface, and promoting a healthy reaction of the skin. The proper way to use them is, after the body has been thoroughly dried, to rub them briskly over the entire surface, but not too severely, for considerable injury may be inflicted on the skin by their unmerciful application. The glove ought not to be hard and unyielding. Those manufactured by Dinneford, and imported by Cumming, Dodge & Co., 43 Fulton street, and sold by all respectable druggists, are immeasurably superior to all others. In those gloves the points of the hair are perpendicular to the surface, like a brush; they are very soft and agreeable, and at the same time efficacious, and are not likely to injure the tenderest skin. There are some very beautiful ones expressly prepared for the use of ladies.

The apartment in the house where the bath is taken should be airy and comfortably warm in winter.

When a complete bath cannot be conveniently obtained, a wet sponge or sheet may be substituted; this, though not so efficacious, is nevertheless very beneficial. The wet sponge should be quickly rubbed over the body, which must be as quickly dried. In many cases salt may be added to the water with good effect.

The salt-water bath in the open sea, in pleasant weather, is superior to any other form of cold bath. The topical action of the salt-water is more stimulant than fresh water, from the nature of the saline particles that it contains, and from its greater weight, being about one-thirtieth part heavier it produces a greater degree of concussion.

The reaction is almost immediate and certain; and consequently it may be indulged in a little longer than common water, and persons are less likely to take cold after it.

The tonic effects of the salt-water, the fine fresh air, and the exercise of swimming and moving about, combine to make it both exhilarating and invigorating. These good effects are, however, frequently diminished, or, indeed, positive evil is often produced, by remaining too long in the water. Prudence should, therefore, be exercised in this respect, as well as in choosing the most proper time for bathing. A bath ought not to be taken either immediately before or for several hours after any meal, and early in the morning is decidedly the most healthful time.

The art of swimming is one of the most useful accomplishments a youth can acquire, for by it he may be enabled, in case of emergency, to save his own life or rescue that of a fellow-creature from an untimely end. I will, therefore, say a few words on the subject.

The principal thing required in learning to swim is confidence; I therefore wish to impress upon the mind of the learner one or two philosophical facts. All bodies that float on the surface of the water, displace as much fluid as is equal in weight to the weight of the bodies; therefore, in order that a vessel may keep above water, it is necessary that the vessel and its cargo should be of less weight than the weight of a quantity of water equal in bulk to the part of the vessel which is immersed in the water. Now, by actual experiment, it has been ascertained that the mean specific gravity of the human body is one-ninth less than that of common water, so that as we are specifically lighter than water, it only requires a little skill to enable us to float like a piece of wood, and this principally consists in occupying a proper position in the water; the great desideratum is to lay perfectly extended, the whole body and limbs being kept under the water except the face, because the head, legs, and arms are heavier than the water, though the body is not, and consequently, if they are kept above the water they sink the body, just as too large a cargo would sink a ship.

A person who has not learned to swim endeavors to keep his head too much out of the water, and loosing his presence of mind throws his arms upwards, and by his efforts and struggles raises himself so high above the water that his body does not displace so much of the water as is equal to its weight, and he immediately sinks; he takes water in by the mouth and nostrils, which soon renders him as heavy as the surrounding element; the coldness of the water, and, perhaps, his own fears have a tendency to contract the entire body, and, of course, to increase its weight in proportion to its bulk, and all these things combined causes a person to sink. But if the beginner will only recollect the fact of his body being in reality lighter than the water, the very knowledge of this natural buoyancy ought to be sufficient to give him full confidence in his next attempt at swimming, and by trying to avoid all effort and laying flat with only his face above water he will soon be enabled to strike out gently with his hands and feet, and be gratified to find that he has already conquered what hitherto appeared to him almost an insurmountable difficulty.

Young persons who cannot swim ought to be careful to ascertain the real depth of the water before venturing to plunge in, for if the water be clear it appears less deep than it really is, because, according to the law of reflection, of which we before spoke, when explaining the cause of an oar appearing to be crooked when immersed in clear water the image of the part or bottom lies above the object, hence the depth of a stream is one-fourth part greater than it appears to be; in other words, suppose the water to be six feet deep, on looking at the bottom it appears to be only four and-a-half from the surface.

Those persons, who from want of time and opportunity cannot avail themselves of bathing in the open sea, can find a most admirable substitute in the excellent floating salt water baths of that respected and experienced veteran in the art of bathing,

Dr. Rabineau ; indeed, I believe I will be doing good service by extracting a leaf from the Doctor's directions to his bathers :

“ While particular care should be taken never to go into the water in a state of extra perspiration or great heat, it is equally necessary to have a strict regard to a proper temperature of the body, so that being cautious of too great heat, we should be equally so of too much coolness.

“ If one rule should be urged upon the attention of bathers more strongly than others, it is that in coming to the bath, and being in a perspiration, they should never take off their coats or dresses, and remain sitting for a time to get cool, but rather remain with them on until they are in a proper temperature for the water, and that should ever be above the heat of the water, to have the most desirable effect. The best effect is lost in getting too cool before going in, and most certainly no good can be obtained by staying in too long.”

In connexion with this subject I may mention that hot salt water baths, so decidedly effectual in some cases, can only be procured in this city at Dr. Rabineau's establishment at the foot of Desbrosses street, and here they can be had throughout the entire year ; while at the Astor House, his warm, cold and shower baths, of the pure and limpid Croton, are attended with all the appliances and comforts that really make the bath not alone desirable but positively luxurious and truly healthful.

EXERCISE.

Exercise is essential for the promotion and enjoyment of good health, whilst, on the contrary, sedentary habits are the fruitful source of numerous maladies, especially of the eyes. Exercise is a powerful means of strengthening sight and preventing disease. The experienced practitioner quickly discovers, by the peculiar unhealthy appearance of a patient, if his disease arises from want of proper exercise, and often, by inducing regularity in this respect, is enabled to remove the disease, or at least render it much more easily influenced by curative remedies.

As a mode of exercise, walking is equal to any, and fortunately is accessible to all, whether poor or rich. In walking all the muscles are brought into play, and the dormant energy of nearly all the organs aroused; the blood circulates with freedom, the countenance is radiant with the tinge and glow of health, and the eyes sparkle with renewed lustre. But, walking to be thus beneficial must not be pursued as a task, or taken with the spirit of martyrdom with which we swallow a dose of salts, for the sake of the good to be accomplished; nor yet will the daily pilgrimage from home to business, and from "down town" and back again, secure this object.—Too well the care-worn visage and hurried gait of the slaves to mammon demonstrate the inutility of exercise without *soul*. This then, is the great desideratum; the mind must be amused and the eye delighted with varying and novel scenes; fresh country air clear sky, and green fields, particularly if enjoyed in the society

of a valued and cheerful friend, combine to render walking attractive, desirable and healthful.

Every one has observed how much the pleasure of a pedestrian excursion is increased if it be enlivened by the conversation of an agreeable companion. The old Roman poet understood how much the wearisomeness of even a toilsome walk is beguiled by the society of a kindred spirit, when he wrote—

“Comes jucundus pro vehiculo est.”

A pleasant companion is better than a carriage.

Somewhat similar was the feeling of the French traveller who pathetically bewails the sad fate which compelled him to “wend his solitary way” through verdant meads and blooming landscapes. “*O, qu’il est triste de voir un beau pays sans avoir personne a qui dire ‘voila un beau pays!’*”

Exercise on horseback possesses superior advantages in some cases, as it can be enjoyed by the invalid for a longer period without fatigue or weariness.

Exercises which employ both body and mind in the open air, such as the manly and scientific game of cricket, throwing the quoit, leaping, running, and ascending heights, may be deemed the most effectual means of expanding the chest and promoting sound health. As many persons engaged in business or sedentary occupations cannot take all the exercise abroad that is necessary for their health, they ought, if possible, to visit a gymnastic establishment and there exercise moderately every day; also use the dumb bells at home every morning and evening, and walk about in their own stores or houses for at least an hour every day, for although such proceedings will not compensate for the loss of exercise out of doors they are the best substitute for it that under the circumstances can be resorted to. For young ladies the use of the skipping rope,

exercise with the shuttle-cock and battle-door, playing the graces, singing and reading aloud, dancing, and daily practice at the Kalisthenic Institute, will be found of great advantage, and, indeed, is absolutely necessary to promote the growth and preserve the health of those who have not the opportunity and inducement to exercise that is afforded in rural life. Most assuredly the elegance of the female frame will be better attained by walking in the open air, reading their books in the green fields, under some umbrageous shade, riding on horseback and using the cold bath (other circumstances permitting) than by the pernicious habit of confinement all day to the house so frequently indulged in, and afterwards walking out in the night air in thin attire.

Exercise, to be beneficial, should be regular, and not excessive, and, like bathing, should not be engaged in immediately before or after meals. I need scarcely add that in this climate the mornings and evenings are the most desirable periods during the warm season, and mid-day in the winter.

DIET.

The necessity of attention to diet for the preservation of the general health is so obvious as to render superfluous any preliminary observations for its enforcement, but as many affections of the eyes are produced by improper diet, we shall briefly consider the subject.

Wholesome and sufficient food, composed of a due admixture of animal and vegetable substances, is the proper subsistence of man; indeed the constituent elements of animal and vege-

table matter are identical. The former contain a larger amount of the nutritive principle; the latter take a longer time to digest, and are more likely to sour on the stomach.

Solid food is more easily digested than liquid, and therefore invalids ought to partake sparingly of soups and fluids.

The cooking of food is extremely important. Boiled, roasted and broiled, are the most proper modes of cooking for delicate persons, but even these simple culinary operations require skill and experience to be executed aright; to render some articles digestible considerable cooking is necessary, while a similar proceeding with others would produce the opposite effect.

Professor Liebig, of Germany, has recently written a letter to Professor Silliman, a portion of which is taken up with examining the relative advantages of boiling and roasting meat:

“The method of *roasting* is obviously the best to make flesh most nutritious. But it does not follow that boiling is to be interdicted. If a piece of meat be put in *cold* water, and this heated to boiling, and boiled till it is “done,” it will become harder and have less taste than if the same piece had been thrown into water already boiling. In the first case, the matters grateful to the taste and smell go into the extract—the soup; in the second the albumen of the meat coagulates from the surface inward, and envelopes the interior with a layer which is impregnable to water. In the latter case, the soup will be indifferent, but the meat delicious.”

As a general rule white and young meats, as lamb, veal, pork and fowl, ought to be well dressed, while beef, mutton and aquatic birds are better underdone.

Baking and frying are decidedly the most injurious methods of cooking, as food thus prepared is very indigestible.

Our feelings are often the best guide as to what we ought to eat and what abstain from. Many persons have an idiosyncrasy, or peculiarity of constitution in respect to food, the simplest things as mutton, fish, honey, &c., acting on them as poisons, and this is not from caprice or whim on their part.

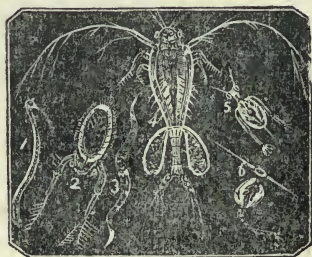
Within the circle of my own acquaintance is a lady, who, having on one occasion partaken freely of oysters, to which she was very partial, was seized with violent and alarming pains in the stomach. The oysters were probably in an unhealthy state for it was then the summer season. This occurred several years ago, and as the taste for oysters still continues she has several times ventured to indulge slightly. They have also been disguised and given to her, but in either case the result is alike—she is invariably attacked with the most excruciating and dreadful pains.

Some patients require a generous diet: to such, boiled leg of mutton, roast beef, broiled mutton-chop, the back of a rabbit, boiled fowl and chickens, nice sweet-bread and tripe, are most suitable. White fish, and raw oysters, eggs lightly cooked, good dry potatoes, turnips, asparagus and tomatoes, and fresh and ripe fruit, are also appropriate, and for beverage, the pure Croton, although, in some cases of debility, it becomes necessary to prescribe a little wine, ale, porter, or even weak brandy and water. Good black tea or a limited quantity of coffee, neither too strong, are refreshing and beneficial. Goats and asses milk and butter-milk, also agree well with some valetudinarians.

Water; the natural drink of man, next to the air we breathe, is the most essential element of vital existence. It therefore becomes a matter of the first importance to obtain it of the utmost purity. Rain water procured in the country, free from the contaminations of large towns, is the purest water, but nevertheless it contains a considerable quantity of carbonate of ammonia.

Spring and pump water are impregnated with various saline ingredients which they dissolve in percolating through the rocks and earth, they are, therefore, not suitable for dyspeptic persons. River water is a mixture of rain and spring water, but from whatever source it is derived it always contains more or less decomposed organic matter in suspension or solution which is formed mostly of the exuviae of vegetable and animal substances.

By means of the solar or oxyhydrogen microscope myriads of animalcules can be observed inhabiting the minutest quantity of river water. These aquatic animals, as also vegetable parasites, (*entophyta*, and *entozoa*,) it is not at all beyond the range of probability to suppose may produce disease in the human system, and various cases have been cited where such apparently was the case. The engraving exhibits a magnified



view of some of these little animals. Now by filtration, these as well as all other suspended impurities can be removed, and this is most thoroughly accomplished by Jennison's Diaphragm Filter, a most admirable and excellent contrivance, the result of skill and science and a fresh contributor to human happiness and comfort. These filters ought to be used in every

family where health, cleanliness and purity are really appreciated. They can be procured in most of the large cities of the Union, and in this, at 349 Broadway.

The invalid must avoid all indigestible food, as salt and smoked meats, salt fish, butter and fatty substances, hot-bread, rich cakes, pastry, pan-cakes, fried dishes, lobsters, &c. The periods for eating ought to be fixed, with an interval of four or five hours between each meal. We should always rest before and after each repast, and retire from the table with some appetite still remaining. Most persons have seen the quaint distich of the able but eccentric ABERNETHY—

“If you wish the gourmand’s motto to follow,
Eat, digest, *masticate*, and swallow.”

The state of the bowels and of the digestive system is of the utmost consequence, and demands unremitting and regular attention. The practice of constantly taking medicine to produce order in this respect cannot be too forcibly objected to. An occasional mild aperient may be necessary, but habitual purgatives are destructive to the well-being of the general economy, nor do they accomplish or induce the desired exactitude; as after their operation has ceased the bowels become more constipated. To effect regularity the great secret is to set apart a precise hour, and never to defer, or allow any interruption to, the methodical daily attention to this point at that particular period. This plan, if perseveringly pursued, will be ultimately crowned with complete success, particularly if attention be paid to diet, and when requisite a proper selection made of such articles as have a laxative tendency—such as vegetables and fruits.

TOBACCO.

The wide spread habit of smoking has not yet had due medical attention paid to it and its consequences. The effects produced by the immoderate use of tobacco have been recently so clearly pointed out by the eminent Dr. Laycock, that I cannot, I think, do better than avail myself of his description of them—premising that my own observation fully confirms its justice and accuracy.

It is only by two or three years' observation that Dr. Laycock has become fully aware of the great changes induced in the system by the abuse of tobacco, and of the varied and obscure forms of disease to which especially excessive smoking gives origin. Some of these he met with in the pharyngeal mucous membrane, the stomach, the lungs, the heart, the brain, and the nervous system. The tobacco consumed by habitual smokers he estimates from half an ounce to twelve ounces per week, the usual quantity from two to three ounces. Inveterate cigar smokers will consume from four to five dozen per week.

The first morbid result is an inflammatory condition of the mucous membrane of the lips and tongue; then the tonsils and pharynx suffer—the mucous membrane becoming dry and congested. If the thorax be examined well, it will be found slightly swollen, with congested veins meandering over the surface, and here and there a streak of mucous. Action ascends upwards into the posterior nares, and there is a discharge from the upper part of the pharynx, and irritation is felt within the anterior nares.

The eye becomes affected with heat ; slight redness, lachrymation, and a peculiar spasmodic action of the orbicularis muscle are experienced, together with intolerance of light on awakening from sleep in the morning.

The frontal sinuses do not escape : there is a heavy dull ache in their region.

Descending down the alimentary canal to the stomach, the results, in extreme cases, are symptoms of gastritis. Pain, tenderness, and a constant sensation of sickness and a desire to expectorate, belong to this affection.

The action of the heart and lungs is impaired by the influence of the narcotic on the nervous system ; but a morbid state of the larynx, trachea, and lungs results from the direct action of the smoke. The voice is observed to be rendered hoarser, and with a deeper tone. Sometimes a short cough results ; and a case of ulceration of the cartilages of the larynx came under the doctor's notice. The patient was such a slave to the habit that he hardly ever had the pipe out of his mouth. Similar sufferings have been caused by similar practices in other instances.

Another form is a slight tickling low down in the pharynx or trachea ; and the patient coughs, or rather hawks up a grumous looking blood. It is so alarming as to be mistaken for pulmonary hæmoptysis.

The action of tobacco smoking on the heart is depressing ; and some individuals who feel it in this organ more than others complain of an uneasy sensation about the left nipple—a distressing feeling, not amounting to faintness, but allied to it. The action of the heart is observed to be feeble and irregular. An uneasy feeling is also experienced in or beneath the pectoral muscles, and oftener on the right side than on the left.

On the brain the use of tobacco appears to diminish the rapidity of cerebral action, and check the flow of ideas through the mind. It differs from opium and henbane, and rather excites to wakefulness, like green tea, than composes to sleep—induces a dreaminess which leaves no impression on the memory, leaving a great susceptibility, indicated by a trembling of the hands and irritability of temper. Such are the secondary results of smoking. So are blackness of the teeth and gum-boils: there is also a sallow paleness of the complexion, an irresoluteness of disposition, a want of life and energy, and, in constant smokers who do not drink, a tendency to pulmonary phthisis.

Dr. Wright, of Birmingham, in a communication to the author, fully corroborates these opinions; and states that smoking not only is very hurtful to the organs of vision, but produces gastric affections and lowness of spirits; and, in short, is very injurious to the respiratory, circulating, alimentary and nervous system.

EDUCATION.

Train up a child in the way he should go and when he is old he will not depart from it."—*Proverbs*.

This is a very impressive command combined with a solemn assurance of an ultimate reward for the trouble, anxiety and perseverance necessary for the instruction of youth. But parents and others entrusted with so grave a responsibility as the education of the rising generation ought to know that it is not enough to inculcate sound moral and religious principles in the

minds of their young charge, or to have them perfected in every grace and accomplishment of modern times; there is yet another duty to be performed, often too much neglected—physical education—for while constant and untiring mental efforts are ever required to furnish and adorn the interior, the substantiality of the structure or tenement where all is to be lodged, meets with but little consideration and less care. Indeed these attainments are sometimes purchased by a dreadful sacrifice. All this might be amended or prevented by a happy combination of mental and physical education.

I do not for a moment under-estimate the value of parental and early mental culture, and the advantage of training up children to habits of obedience and industry, for I recollect the terrible judgment attendant on disobedient and undutiful children, according to that awful scriptural denunciation—"THE EYE that mocketh at his father and despiseth to obey his mother, the ravens of the valley shall pick it out and the young eagles shall eat it."

But I would endeavor to impress upon the mind of the reader that the severe studies in some schools are indeed *tasks* whereas, they should be regulated in proportion to the tender age and strength of constitution of each pupil. Early over-application to books has caused in many persons obscurity of vision and even entire blindness, rendering the balance of their days miserable and unhappy. This early over-use of the organs of vision before the system is perfected is one reason why so many students and young persons among the wealthier classes are short-sighted and compelled to wear glasses. Indeed many a student would be relieved from the lassitude which he feels while pouring over his books, would he but give a portion of his precious time to the improvement of his health, and if he cannot be persuaded to do this he will prove to his sorrow that "much study is a weariness to the flesh."

Childhood is the period of exuberant and indeed vehement activity, and nature requires almost unlimited and constant exercise. If at this youthful and joyous period of existence we prohibit the full and free enjoyment of muscular exertion we are acting contrary to the dictates of nature and this we cannot do with impunity.

I have elsewhere alluded to the various kinds of exercise; of course, in selecting the mode of exercise proper for either sex, nature and our own sense of propriety must be our guide.

—though both
 “Not equal, as their sex not equal seemed,
 For contemplation he, and *valor formed*;
 For softness she, and *sweet attractive grace*.”

HOUSES, OFFICES AND MANUFACTORIES.

When we have an opportunity of making a selection, a dry elevated location, surrounded by a free circulation of air ought always to be chosen, and in cities the sunny side of the street is the healthiest. Marshy situations are detrimental to vision, and where necessity compels a residence in such vicinage it were prudent to occupy a position as much to windward as possible.

The rooms should be lofty and well lighted, not in the modern style with windows down to the floor. However novel and elegant this may appear, it is not an improvement on the good old plan of our ancestors, for through such windows the light is reflected from below, and all objects are consequently viewed in a false light.

The light should shine directly on the windows, and not be reflected from some opposite wall or building, particularly if these should be painted white, or white-washed. I have frequently remarked with surprise, that many merchants and others who reside in princely palaces up town immure themselves for perhaps twelve hours a day, or one half their natural lives, "cabined, cribbed, confined," in close back offices totally dependant on the reflection from their neighbour's whitened wall for the highly detrimental and limited supply of light which they receive. Nothing can be more trying or injurious to weak eyes.

Sleeping apartments and manufactories, where a number of persons congregate, ought to be very freely ventilated. Few things contribute more towards healthy strong eyes than plenty of fresh air, while many diseases are engendered by an impure atmosphere: the offensive exhalations from our proverbially dirty streets are a potent and frequent cause of disorders of the eye.

The light should be so admitted into the rooms as to be as regular as possible. When it is too glaring a blue or green window shade will be of great advantage. The window shade, or curtain, ought to be arranged so as not to blow backwards and forwards, for such vacillation is constantly exposing the eyes to sudden changes of light.

The walls and furniture of the rooms ought not to be of a bright dazzling color. Too much gilding is also very trying to delicate eyes.

The position of the bed in our sleeping apartment is an object of some importance: it should not be placed opposite to the rising sun, for this situation would expose us to a strong and sudden light on first awaking in the morning.

It would be very desirable if the room occupied in manufactories, or elsewhere, where persons are engaged in minute and fatiguing work, had a good perspective or view from the window, for great relief would be experienced in occasional cessation from work, when the eyes felt weary and clouded, by looking out at distant objects. This is the natural relaxation of the eyes.

How beautifully the wisdom and forethought of a kind Providence is illustrated by the pervading colors of nature—the green grass and the soft blue firmament present the colors the coolest and most refreshing to the eye.

From the cradle to the grave the eyes are used unsparingly, and scarcely is the tiny tenant of the former rocked to slumber ere it is startled from its short repose and its little eyes are exposed to a painful and dangerous ordeal, for no practice is more common than that of taking a new-born babe to the bright glare of the sun or a lamp, to exhibit the little stranger to every new visitor. It cries from the pain caused by the light acting on its tender retina. The little “deary” is hushed up, its feeble screams of agony are attributed to any thing but the true cause, and the same ceremony is repeated over and over again—resulting, unhappily but too often, in weakened or diseased vision. But the injurious effects of a sudden transition from gloom to bright light, are by no means confined to infancy. We all have felt pain and uneasy sensations on suddenly going out into the bright sunshine from a dark room, or on candles being introduced into the apartment where we have been sitting for some time without light.

A memorable instance of the effects of such sudden change occurred at the demolition of the French Bastille. On the day on which the head of Robespierre rolled on the scaffold, the Parisian people, frantic with joy, burst in the gates of that

infernal prison, and gave freedom to the captives who had so long pined within its dismal walls. These, delirious with delight, rushed through the doors, slippery with the blood of so many of their ill-fated companions. But their eyes so long accustomed to the deep gloom of the dungeon, were unable to bear the sudden flood of light poured in upon them by the burning beams of a summer sun; and many amongst them only exchanged one sad calamity for another—the darkness of the prison for that of perpetual blindness.

The destructive effect of a sudden influx of light has sometimes, with wicked ingenuity, been made the instrument of inflicting the keenest torture, for “man’s inhumanity to man,” has ever been a stain upon our common nature. Dionysius, the tyrant of Syracuse, used to confine his unhappy victims in dungeons of the deepest darkness, from which they were violently thrust into a chamber, illuminated with the most intense glare of light. The poor wretches, after enduring the most excruciating agony, were thus quickly deprived of sight.

Every student of ancient history is familiar with the cruel revenge inflicted by the Carthaginians on Regulus the Roman Consul and General, when they had at length made him prisoner after they had endured a series of disastrous defeats on many a battle field over which the Roman Eagles had remained floating in triumph. They shut him up in a dark prison, and then, with barbarous cruelty, having cut off his eyelids, they exposed him to the fierce rays of a burning sun. In a short time the visual orb was extinguished for ever.

ARTIFICIAL LIGHT.

Artificial light is much more injurious and irritating to the eyes than the pure light of day, because the red and yellow rays preponderate over the blue; consequently if we direct our eyes to a book or sheet of paper, we perceive it appears of a yellowish or reddish tinge instead of white as in the day time; the contrast between the letters and the paper is not so marked, the letters are not so accurately defined, and a greater effort of the eyes becomes requisite.

The increased heat from artificial light irritates the eyes, and causes chronic inflammation of the lids and a diseased state of the secretions. Where many lights are used the air of the room becomes parched, dry and hurtful to the eyes, producing itchininess and stiffness of the lids.

The great desideratum in artificial light is to have it as regular and steady as possible.

The qualities most desirable in a good lamp are, that the light should be pure, sufficient, unwavering, and equally diffused and unaccompanied by smell or smoke.

To attain these ends it is necessary that the oil should be of a proper fluidity and be constantly elevated to the point of combustion. In the ordinary lamps, as the astral and solar,

the light diminishes as the oil becomes lessened in the reservoir. The viscosity and consequent sluggish supply of oil to the wicks is a great obstacle to the combustion of lamps, "an obstacle nearly insuperable with lamps of the common construction during the winter months." The admission of an adequate supply of atmospheric air to the flame is also essential, as otherwise the light will be insufficient, or the lamp will smoke on the wick being elevated.

Among the vast number of lamps that have been constructed I cannot find one that combines these desiderata, or indeed that is free from objection. Dr. Ure says the Mechanical or Carcel Lamp does not possess the necessary attributes, for the oil being pumped up through tubes by clock work to the wick "prevents perfect uniformity since it fluctuates a little, but always perceptibly to a nice observer with the alternate action of the pump work becoming dimmer after each successive jet of oil and brighter just before its return. The flame, moreover, always flickers more or less, owing to the powerful draught and rectangular reverberatory shoulder of the chimney," and he concludes by remarking that "they can hardly be trusted in the hands of a servant, and when they get at all deranged they must be sent to their constructor to be repaired."

The next lamp that deserves attention is Parker's Hot-Oil Lamp. By means of this contrivance the viscosity of the oil is overcome and from the position of the reservoir being above the wick a constant supply of oil is secured at the proper elevation without the necessity of any complicated mechanism. The highly scientific author from whom I have before quoted, says that "the Hot-Oil Lamp burns with a much steadier flame than the Mechanical;" and he ascertained that its relative illumination, when compared with the Mechanical Lamp was 121 to 100, while the French Annular Lamp was found to reach only 50. Notwithstanding all this I must say that I do not consi-

der Parker's Lamp by any means perfect. The following table is the result of Dr. Ure's investigations :

Cost per hour of 100 Illumination.

	<i>Pence.</i>
Mechanical or Carcel Lamp, with sperm oil, - - - - -	1½
Parker's Hot-Oil Lamp, do. do. do. - - - - -	1
French Lamp, do. do. do. - - - - -	1½
Wax candles, - - - - -	6
Spermaceti candles, - - - - -	5½
Tallow candles, - - - - -	2½

Lamps possess an advantage over candles, inasmuch as we can increase or diminish the light as is most desirable.

Wax or good spermaceti candles produce a very excellent light, but two or more should invariably be used, when reading or working.

Dr. Ure says, "after comparing lights of many kinds, I have every reason to conclude that a large wax candle of three to the pound, either long or short, that is either 12 or 15 inches in length, as manufactured by one of the great wax chandlers in London, and furnished with a wick containing 27 or 28 threads of the best Turkey cotton, is capable of furnishing a most uniform or nearly invariable standard of illumination." And he adds that it is very remarkable that whether they were three's, four's, or six's in the pound, each afforded very nearly the same quantity of light, for each required to be placed at a distance of three feet from the screen to afford a shadow of the same tint as that dropped from the Mechanical Lamp estimated at 100.

Artificial light is a highly interesting and important matter, especially to persons with tender eyes who are compelled by necessity, or who from inclination devote many hours every night to reading, writing, sewing, or minute work of any description. Such persons very frequently, and, indeed, justly

attribute various distressing sensations and diseases of the eyes to improper or unsuitable light. The subject of illumination has occupied my attention for some time, and I am at present engaged in making a series of experiments. The result of my investigations I hope at no distant period to be enabled to present to the public in some useful form.

Candles or lamps should not be placed before the eyes; the light should not fall perpendicularly or horizontally on the sight but obliquely, and if there are two or more lights in a room they should be of the same height.

The injurious effects of artificial light may in some degree be prevented by protecting the eyes from the direct action of the light, by having a shade over the lamp. This shade, or reflector, ought to be made of tin or brass, bronzed on the outside, and painted with ultra-marine of a light blue color on the inside. The inner surface should be smooth and even, and destitute of polish, or shining properties. Light that is thrown from such a shade on a book or paper, will cause it to appear whiter and the letters more distinct, and the light will be refreshing and cooling to the eyes.

If a proper lamp, so arranged, be suspended in the centre of a room where a number of persons are working around a table, there will be sufficient illumination for the minutest work.

Shades for lamps or candles, may be also made of paste-board, the inside colored as above, and the outside of a gray or neutral tint.

Light blue glass chimneys are very useful, as they give the light a soft pleasant hue.

Plain ground glass shades soften and diffuse the light, but those that are cut are highly objectionable.

Some artizans use a glass globe, filled with water, to concentrate the light on their work. This contrivance is not to be recommended; but if a small quantity of ammoniated copper is added to the water, say sufficient to throw a sky blue color on a sheet of paper held behind the bottle in the day time, it will be found to render the light purer and more refreshing.

Carbonic acid gas, which is produced by respiration and during combustion, is a strong narcotic and destructive to life. It is computed that when an apartment containing a number of persons is illuminated to the ordinary extent, four times as many cubic feet of fresh atmospheric air a minute, as there are persons in the room, are requisite.

When the carbonic acid gas, which is generated by respiration and the lights, is conveyed away, and a fresh supply of air freely supplied, no injury ensues; but crowded rooms, with numerous lights, and badly ventilated, are very pernicious, causing headaches, distempered eyes, and general injury to body and mind.

Compositors, particularly those engaged on morning papers, suffer more from these causes than any other workmen. Therefore, in addition to the rooms being well ventilated, the lamp ought always to have a tube with a funnel-shaped mouth hung over it, and this tube or pipe should be continued out through the roof, or into the chimney, to carry away the foul air.

It is to be regretted that a little more attention is not paid to the position of the lights in our Lyceums, Lecture-rooms, and other Public buildings. The mind is so entertained by the proceedings of the evening, that it pays but little heed to the occasional hints that the eyes give of the discomfort to which they are subjected by being exposed to the bright glare of a lamp or gas-burner, and the consequence not unfrequently is that these

do not recover for several days from the irritation thus produced. The lights ought to be of greater power than they usually are, and suspended in a more elevated situation. This arrangement of them would not only very much relieve the eyes, but improve the atmosphere of the building, for much of the impure and vitiated air being above the level of the lights, would thus escape upwards without offending the lungs of those sitting below, and in this way, not alone the eyes, but the respiratory organs also would be saved from much, and, sometimes, irreparable injury

GENERAL OBSERVATIONS.

Many persons have a habit of rubbing their eyes in the morning to remove, as it is expressed, the "sleep" from them. This is a very pernicious custom. The undue pressure on the eyes is highly injurious, and considerable irritation is constantly produced by the eye-lashes being forced into the eyes. It is much more proper, and certainly more luxurious, to bathe the eyes with a little cold water, or if the secretions have become hardened at the root of the eye-lashes, tepid water may be substituted.

Bathing the eyes two or three times a day, particularly in dusty weather, or whenever they feel heavy or fatigued by close application, is salutary and beneficial, and very invigorating to the vision. This, however, should never be performed while in a state of free perspiration.

The jet, or Douche Bath, is exceedingly appropriate and sometimes of incalculable advantage in those cases termed

"weakness of sight," and also in a great variety of other affections arising from debility or want of energy in the nervous structure of the eyes.

Cologne water, or other spirituous applications to the temples, once or twice a day, may be used as additional auxiliaries for restoring the tone of the eyes.

It is exceedingly important to guard the eyes against exposure to the injurious effects of brilliant and reflected light. The most disastrous consequences may result from the neglect of this precaution; and so well has this been taught by experience to even the unlettered savage, that he has invented a sort of snow spectacles, or *snow eyes*, "*yeux a la neige*," as they are called by the French settlers near the Esquimaux of Hudson's Bay, to preserve the eyes from the dreaded effects produced by the intense reflexion of the sun's rays.

The most dreadful sufferings, and, in numerous instances, a total loss of vision, have been endured by whole armies in marching through the parched and sandy deserts of the East, where—

"Vertical the sun,
Darts on the head direct his forceful rays:
In vain the sight dejected to the ground
Stoops for relief; thence hot ascending streams,
And keen reflection pain!"—*Thompson*.

The celebrated Greek historian Xenophon, mentions, in that admirable and graphic work, the "*Cyropedia*," that on one occasion the army of Cyrus marching for several days through mountains covered with snow, the dazzling splendor of its whiteness prejudiced the sight of many of his soldiers and blinded some of them.

We ought to avoid exposing the eyes to smoke or to high

wind ; and, when we can conveniently do so, we should keep within doors when the dust is blowing about.

We must not tax the eyes too much, even although they may seem to be in a sound state, if we are desirous of possessing vision intact to a good old age. Continued reading of bad print severely tries the eyes, as does the pernicious custom of reading by twilight or by the light of the fire.

Newspapers require to be well aired or dried before venturing on their perusal.

Students and literary persons will find it a great advantage to vary their position while pursuing their studies, by sometimes standing at an elevated desk, thereby avoiding the constant stooping of the head. Another golden rule for their observation is never to go to bed with cold feet.

Young persons, of delicate sight, ought to select an occupation, or business, that does not require a close application of the eyes ; but persons with impaired vision, who are advanced in life, and who are dependant solely on their labour for a subsistence for themselves, and perhaps their families, are, indeed greatly to be commiserated if their employment is of that minute nature which is so injurious to the sight. Book-keepers, compositors, engravers, watchmakers, tailors, and shoemakers, are the persons that most frequently suffer, and especially our poor industrious sempstresses and tailoresses, who toil from morning to night, and, oftentimes, through the long and tedious hours of the night to obtain a scanty and precarious livelihood.

It is necessary to be very prudent and cautious under such circumstances, especially if it be observed that the eyes can no longer see at the distance they were accustomed to, that they feel hot, dull, heavy or painful after close application, which is

relieved by a cessation from employment; or if they present a red, weakened or watery appearance, or that the other premonitory symptoms are present, enumerated in our description of that afflicting disease *Amaurosis*, which is so feelingly portrayed by the suffering MILTON,—

“ These eyes, though clear
To outward view, of blemish, or of spot,
Bereft of light, their seeing have forgot;
Nor to the idle orbs doth sight appear
Of sun, or moon, or star throughout the year!
Or man, or woman !”

Many of the foregoing suggestions will, if adopted, be found beneficial to persons who are forewarned by any of the symptoms above described. I would, in addition, advise them to vary their work as much as possible, and, if practicable, to work only by day-light; or, at least, to select the most difficult work for the day time, deferring the easier part for night-work. Stopping for even a short interval to rest the eyes, and bathing them in cold water, will be found refreshing, as well as walking outside the building for a few minutes, or looking out of the window. Immediate application to business on first rising in the morning, or too soon after meals, ought to be avoided. A flat open vessel, containing water, and placed in a hot room, particularly if it be heated by a stove or anthracite coal, will, from its constant evaporation, in some degree prevent the air from becoming dry and parched; and persons working close to a strong light, will find that if they lay a wet sponge near them it will sensibly moisten and cool the air, and thus, to some extent, relieve the eyes from its hurtful effects.

In several instances of affections of the nervous structure of the eye, I have found the electro-magnetic battery, judiciously applied, a powerful auxiliary in their treatment. It requires however the exercise of some skill in its application.

The Magneto-Electrical Instruments manufactured for this purpose by B. Pike & Sons, 166 Broadway, are decidedly superior to all others that I have examined.

Whenever any trifling affection of the eye occurs, there is usually an immediate resort to the use of *shades*, and this, though very often highly pernicious, the oculist finds some difficulty in preventing, as the opinion of their usefulness and necessity is strongly rooted and universal. They are really requisite where there is great intolerance of light, but in slight complaints they are very injurious.

Case.—On a recent occasion, a celebrated Comedian called at my office. He had on the usual green shade, his eyes were a little heated and tender, and suffused with tears. On entering, he exclaimed, his countenance assuming a peculiarly arch and expressive look,

“Forgive the gushing tear!
Alas! I feel I am no actor here.”

After this somewhat ludicrous prologue, I made an examination, and perceiving that his ailment was very trifling, I recommended him to bathe his eyes with rose-water and to dispense with his shade. He followed my advice, and the tenderness and lachrymation speedily disappeared.

Shades are sometimes necessary when the light is very painful to the eyes, but in slight attacks they are worse than useless, as they prevent a free circulation of air around the eyes; keep up the heat and inflammation, and exclude the light which is the natural stimulus of the eyes. Where they are worn they should be very light, and not press tightly or heavily on the eye or brow. The color of the silk with which they are covered should be either blue or green.

The influence of the mind on the eye and its affections, is highly important, and deserves serious attention. Immoderate excess of any of the passions, unnatural commotions of the mind, anger, rage, and such like, are exceedingly detrimental to the visual faculties. Violent temper must therefore be controlled, undue excitability subdued, and abstinence from other vicious habits inculcated.

The depressing passions, or those that lower the animal and vital powers, especially grief, have a direct tendency to weaken or even destroy sight. Many sad and touching instances of total blindness from excessive sorrow have occurred, where the unhappy and deeply afflicted sufferer "opened the flood-gates of the heart," and "would not be comforted," but was "like Niobe, all tears."

The salutary effects resulting from a serene and tranquil mind, are felt in no part of the system more beneficially than in the eye, allaying its tendency to irritability, and adding to it renewed tone and vigor. It is therefore exceedingly desirable to promote this happy condition of the mind by cheerful company, agreeable society, and occasional indulgence in harmless and innocent amusement or recreation.

Many of the rules that I have urged as essential for the preservation of the eyes, are every day violated by the unthinking with apparent impunity; but although the eyes may for a long time resist these deleterious practices or influences, yet sooner or later must the penalty be paid, for ultimate, if not present suffering will be the inevitable result.

NEAR SIGHT AND FAR SIGHT.

I have elsewhere alluded to what is termed "Asthenopia," (from a *priv. σθενος, strength*, and *ωπς, the eye*) or "weakness of the sight," and the proper course to be pursued under the existence of such a condition of the eyes.

Before, however, entering on the subject of near sight and far sight, I may mention that there is a peculiar state of the eye called "Day-blindness," or, as it is technically termed, Hemeralopia, from *ἡμερα, day*, a *priv.* and *ὄψις, vision*. Where this exists the individual can only see imperfectly during the day, but in the evening vision is greatly improved. This affection seems to arise from a particular sensibility of the retina to light. The Albino labors to some extent under this disadvantage.

There is another affection, Nyctalopia, (from *νύξ, night*, a *priv.* and *ὄψις, vision*.) or "night-blindness," wherein the person can see with distinctness during the day but cannot distinguish objects in the evening or at night, this being exactly

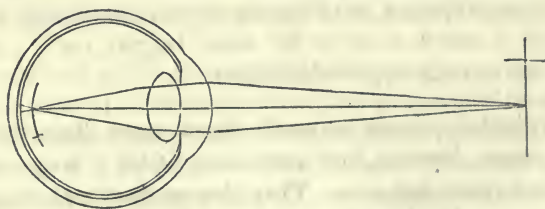
the reverse of the former affection. I had recently a patient, a coloured man, a native of Cuba, who laboured under this defect from his childhood. He was a tailor, and could see distinctly to work in the day-time although he held objects closer to his eyes than is usual, but he could not see at all at night. After some preparatory treatment I provided him with concave glasses, and by their aid, to his great satisfaction, he was enabled to walk about the streets in the evening, as he could discern sufficiently well to avoid coming in contact with the passers-by.

SHORT SIGHTEDNESS.

Myopia, so called from the Greek words $\mu\upsilon\omega$, *I shut*, and $\omega\psi$, *the eye*, because when short-sighted persons look at distant objects they half close the eye-lids. If a person cannot see to read with distinctness and ease common-sized print at a distance of about twelve inches, he may be said to be myopic or short-sighted. If, on the other hand, the point of distinct vision is at a greater distance than fifteen inches, he is said to be presbyopic or far sighted. Perfect vision ranges from nine to fifteen inches. If it is below nine or above fifteen inches it may be distinct but it is not perfect. Near sight is almost exclusively confined to young persons, but not invariably, as aged persons are sometimes near-sighted. It is generally first observed about the age of puberty, when steady application of the eyes is required for study or any minute occupation, and this is the reason why so many young persons devoted to literary pursuits are short-sighted. The individual remarks that he cannot see so well as his companions or acquaintances, cannot distinguish his friends at a little distance, nor read the names of streets or sign-boards without approaching close to them, and when reading he must

bring the book closer to his eyes than the generality of persons do. If he puts on a pair of concave glasses he is quite astonished and pleased to find that he can see with the utmost clearness objects which were before undistinguishable at the same distance.

Myopia gradually increases if too close application of the eyes is made to minute objects. It has been caused suddenly in some instances by exposure to cold or damp. It is, however, generally caused by some peculiar mechanical conformation of the eye, or by too great a density of the refractive media. The cornea or the crystalline lens is too convex, or the distance between either of these parts and the retina is too great, or their refractive density is too powerful, or the adjusting power may be disarranged. We noticed before, when speaking of the formation of images, that the rays of light flowing from the object at which we look are brought to an exact focus on the retina, and consequently the image is depicted there. We also ascertained in examining the properties of convex lenses that the greater the convexity the greater is the refractive power, so that if any of the causes which I have just now enumerated exists, the rays of light proceeding from the object are too powerfully refracted, and unite in a focus before they arrive at the retina, as exhibited in the annexed diagram.

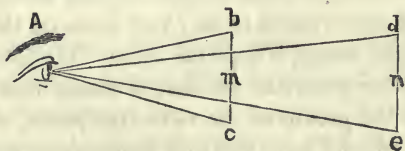


Although the focal point of the rays does not reach the retina but is anterior to it, nevertheless some sensation is produced, being a kind of indistinct vision, and this is caused by the rays

crossing one another at their focal point and proceeding on to the retina where they form a faint and confused impression.

Near-sighted persons are observed generally to have prominent eyes. The cornea is convex, the anterior chamber deep, the pupil large, and the entire eye firm to the touch ; sometimes, however, there is no peculiarity noticeable, as the difficulty may be in the interior of the eye.

Near-sighted persons see with great distinctness when they bring the object close to their eyes. This is owing to their seeing the object under a greater angle than other persons ; that is to say, the extreme rays, and indeed all the others become divergent, owing to the before-mentioned causes ; this can be seen in the following cut—



A. represents the eye, and the object b. c. seen at m. and also at n. double the distance will of course appear under different angles to the eye, for b. A. c. is larger than d. A. e. and will include it, so that to bring an object close to the eye has the effect of magnifying it, or of causing the rays to diverge, that is though b. c. and d. e. are of the same lengths, yet b. c. being nearer the eye will appear the largest.

Near-sighted persons see small objects more distinctly than other persons, because they view them under a larger visual angle as we have just seen. They also see them with a weaker light, because the object being closer to the eye, a greater number of rays proceeding from it arrives at the eye.

They also see better and a little further off by a bright than

by a moderate light, because the pupil is contracted by the strong light and consequently the circumferential rays, or all but the more central and direct ones, are excluded, and for this reason if they look through a small hole in a card they can see at some distance. It is on the same principle they close the eye-lids when trying to view distant objects.

Fortunately for mankind art offers means for overcoming the inconveniences of short-sightedness. These, however, we will postpone speaking of until we have considered the opposite state of the eye, viz. far-sightedness.

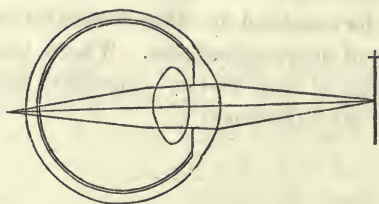
PRESBYOPIA.

From πρεσβυα, old, and ὤψ, the eye.

Far-sightedness—so called, because it is a concomitant symptom of advanced age; but as Myopic eyes are not in every case confined to young persons, so also Presbyopic eyes are not the attribute of advanced age solely, for they are met with occasionally in early life. In most persons, however, the refractive power of the eyes begins to diminish at about forty years of age, and continues to decrease as they become more advanced. In fact, Presbyopia may be considered a natural change.

Persons are said to be presbyopic when they are compelled to hold a book at a distance of two feet or upwards from them when reading, although they had formerly been able to read at a distance of from nine to fifteen inches. Those who are so situated find it difficult to execute any minute work, such as to mend a pen or thread a needle. When persons become far-sighted the eyes do not appear so prominent as they did previously. The cornea or the lens is flatter than formerly, or the distance between these structures and the retina is too short,

and the adjusting power of the eye is generally more or less impaired. The effect produced in either of these cases is to prevent the rays of light flowing from the object from being converged or brought to a focus, until they pass beyond the retina, as is shown in the figure.



Presbyopic eyes have generally a sunken appearance. The cornea is flat and small, and the pupil contracted; and in elderly persons an opaque ring or circle is observed around the margin of the cornea,—the *arcus senilis*, or ring of age. Far-sighted persons see a distant object distinctly, because the rays that flow from it are not as divergent as those from near objects, and consequently come more speedily to a focus. Therefore it is that persons with this condition of eye hold a book at arm's length when reading it, inasmuch as the rays that proceed from it require less refractive power to bring them to a focus at the retina.

Aged persons cannot see minute objects clearly at any distance, because when they are near they are not within the focus of the eye, and when distant they are seen at a small visual angle, and with little light; therefore aged persons in addition to holding the book at a distance from them when reading are accustomed also if it be at night to place the candle before them and near the book, and thus by throwing an increased amount of light on the page they can read with more facility.

The eye in its natural state is, as we have before observed, adjusted to distant objects, and it requires an effort to view near ones. This exertion, if long continued, becomes very fatiguing and indeed painful, and causes considerable uneasiness in the brows and temples. This is more particularly the case with presbyopic persons, for the refractive power of their eyes being lessened, their sensibility impaired, and the adjusting apparatus become rigid by age, an extraordinary exertion and continued straining are requisite to perceive the object.

The density of the refractors is sometimes increased in old persons. This, in some degree, compensates for their flatness: the rays are refracted so as to come to a focus at the retina, and in this way vision is preserved to extreme old age.

THE USE AND ABUSE OF SPECTACLES.

If light be one of the most wonderful and beneficial agents in the material creation, supplying life and comfort to our physical system, giving beauty and fertility to the earth, and unfolding to us the magnificent scenery of external nature, yet if our vision be impaired, we are in a great degree shut out from the enjoyment of those admirable beauties and exquisite pleasures of which light is the essential source.

"Our sight," says Addison, in one of his charming papers, "is the most perfect and delightful of all our senses. It fills the mind with the largest variety of ideas, converses with its objects at the greatest distance, and continues the longest in action without being tired or satiated with its proper enjoyments. It may be considered as a more delicate and diffusive kind of touch, that spreads itself over an infinite multitude of bodies, comprehends the largest figures, and brings into our reach some of the more remote parts of the universe."

But if there be any thing wrong with the wonderful little organ through which this exquisite sense of sight exercises its

beautiful and multifarious functions; if there be any impairment of its delicate and complicated structure, its muscles, its coats or membranes, or different humours with their various refractive powers, we are at once deprived of much of the enjoyment intended to be furnished us through this master piece of Divine mechanism.

One of the most inestimable blessings therefore conferred by art on civilized man was the discovery of spectacles, for without their assistance the inconveniences resulting from the inefficient vision of the myopic, or the presbyopic, would be irremediable; the scholar would be compelled to relinquish the prosecution of his studies, the *litterateur* to abandon his delightful and fascinating avocations, the artist to resign his pencil at the moment perhaps of his highest triumph, and the artizan be deprived of his capital—his eyes, by the use of which he earns a comfortable and independent subsistence.

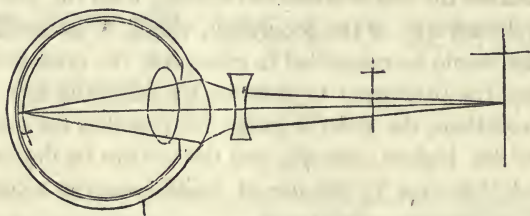
The short-sighted and the far-sighted are thus provided with the means of obviating what would be otherwise an irreparable calamity, by the simplest of all optical instruments—a pair of spectacles.

Surely it is not too much to say that the science which affords such assistance to the defective visual organ is above all price.

The eye without an appropriate degree of light, would be a useless machine. Spectacles collect the light and bring it to the proper point of convergence, and through their aid we are enabled to continue to use the most invaluable of our senses to extreme old age.

SHORT SIGHT.

We have seen that the property of a concave lens is to cause the rays of light to diverge; now, as in the myopic eye the rays converge too speedily, that is, come to a focal point before they arrive at the retina, we place a suitable concave lens before the eye as exhibited below.



This will retard their convergence, in other words, throw back their focal point exactly on the retina, and thus by this simple mechanical contrivance we are at once enabled to relieve the myopic eye and to render it perfectly efficient.

But great as are the advantages afforded by the use of properly selected spectacles, still to decide on the propriety of a patient's using them, requires nice discrimination and sound judgment, for undoubtedly they are injurious to the healthy eye. One finds his sight impaired, and vision indistinct, after perhaps arduous and close application of the eyes, and he is immediately anxious to provide himself with glasses; but it is necessary first to ascertain whether the decrease in the power of vision may not be merely temporary, occasioned by the retina being over-worked, or less sensible than usual to impressions; for if this be the case, although the spectacles for the moment relieve the sight, rendering objects plain and distinct, yet this advantage will be acquired at the price of ultimate

injury, or perhaps complete blindness, the disease being confirmed by this injudicious recourse to spectacles, while other means might have been resorted to that would have preserved vision.

If short-sightedness arises from a change in the refractive media, concave glasses are right and proper; but if it is occasioned by a deprivation of the due adjusting power of the eye to distant objects, then spectacles do more harm than good, nor can their use be again dispensed with, whereas by proper treatment and care the adapting power might have been fully restored.

The next important consideration is the precise time when it becomes necessary to make use of spectacles; for, while the worst consequences may ensue from their too early use, there is no doubt that equally injurious results will arise from deferring it beyond the appropriate period. Age is no guide as to the time when glasses ought to be adopted, for this entirely depends on the deterioration of the eye from ill health, over-use, or original malformation.

Spectacles ought to be procured as soon as the symptoms of short-sightedness, described a few pages back, are developed. No apprehension of injury need be entertained from the use of proper glasses when their necessity is thus indicated, whereas abstaining from their use, under such circumstances, causes constant straining of the eye and irreparable mischief.

But if proper glasses are selected, and judicious care be taken of the eyes, the same power may be sufficient for life. If, however, wrong glasses are chosen in the first instance, or if the organ of sight is misused, the eyes soon become accustomed to them, and after a short time demand a higher power, and further additional changes are soon again required, until the un-

fortunate person exhausts the resources of art and at the same time completes his own misery.

It is an error to suppose that near sight improves as age advances, or that imperfections are removed by the aid of glasses. These, indeed, compensate for the alteration in the refractive media, but they cannot remove it.

To cause the picture to be thrown back on the retina, short-sighted persons wear double concave glasses. The range of vision is altered in proportion to the depth of their concavity, and of course this is different to suit the different cases; the power of those in general use varies from one to twelve inch focus.

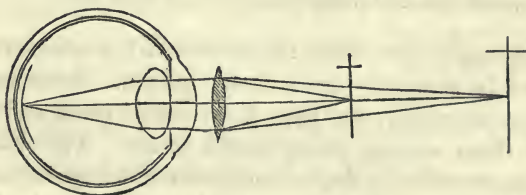
In selecting glasses, the lowest power ought to be chosen that will enable the individual to see with comfort and ease objects that are close at hand, as well as those that are remote. In fact, they should procure rest and comfort for the eye at the same time that they enable it to see with perfect distinctness. If they tire and fatigue the eye, it is a proof that they are not required at all, or that they are totally unsuitable for the case, but if rightly-selected they will relieve and preserve vision. Glasses that diminish the object dazzle and irritate the eyes and must not be worn.

After severe and long-continued exertion the eyes are in a forced and unnatural state, and completely unfitted for determining the most appropriate glasses. So also after trying on a number of spectacles, for the eye endeavours to accommodate itself to every change, and the sight becomes confused and tired. Therefore it is proper in the former instance to rest the eyes for a few days before purchasing; and in the latter not to decide on the spectacles until they have been tested at home for two or three days.

When spectacles are first worn they generally cause headache and vertigo. For this reason they should not in the commencement be used except at intervals, neither ought they at any time to be worn constantly, but occasionally removed, and the adjusting power of the eye regularly exercised by viewing distant objects.

AGED SIGHT.

We know that a convex lens has the power of making the rays converge, and therefore we place a proper convex lens before the eye of the presbyopic as here represented :—



The rays are brought to a focus and made to impinge on the retina, so that by interposing a little piece of glass between the eye of the presbyopic and the object which he views, we are enabled to triumph over the advances of nature and confer upon the aged-sighted the inestimable advantage of remaining in possession of the noblest of his senses.

Those that are long-sighted ought not to defer wearing spectacles from the fear of requiring constantly to increase the power, for if the glasses are properly selected in the first instance, and due care is taken of the eyes, the first number which is usually

worn,—thirty-six inch focus, or preserves, as they are called,—will answer for six or seven years.

These should not be readily changed for ones of higher power, nor indeed till all the symptoms are again present which induced their first adoption.

The lowest power that will enable the presbyopic to see as he was accustomed to before any change took place, ought to be at first selected. With glasses that are not sufficiently convex he cannot see distinctly unless the book is farther from the eye, and if they are too convex the book must be brought nearer to the eye, than when the sight was good. In this latter case the letters will appear larger than they really are, and too powerful magnifiers strain the eyes very much.

Convex glasses should be employed on near objects alone, the unassisted eye will distinguish distant ones best.

Nothing can be more fatally erroneous than the opinion that all persons of the same age require similar glasses. Sometimes we see persons of seventy, who have never worn a glass, and again others at thirty wearing strong convex lenses. The system of regulating spectacles by the various gradations of age has caused incalculable injury. The following is the scale determined upon by opticians; but, as we have said, it must not be relied on:—

YEARS OF AGE.	FOCAL DISTANCE, INCHES.
40	36
45	30
50	24
55	20
58	18
60	16
65	14
70	12
75	10
80	9
85	8
90	7
100	6

It is very detrimental to vision to use glasses of a high magnifying power. A glass that gives blackness and a clear outline to the letters, without diminishing or enlarging them, or straining the eyes, is the proper power to select. The magnifier may be very agreeable for a time in defining any object with more distinctness, but soon a stronger one will be required, for although the eye will become accustomed to undue and continued excitement, yet its susceptibility will be diminished, never, perhaps, to be restored; and there is no returning to the weaker glasses that would have been available at first.

One degree of magnifying power greater is required by candle-light than by that of day. It would therefore be convenient to have two pairs of spectacles—one for day-use, and the other, one degree deeper, for night. Each person must not only select spectacles adapted to his own particular case, but must also ascertain if the focus of each of his eyes is alike. For this purpose look through each glass of each eye separately at small print, and carefully observe whether the effect on each eye is the same from each glass. Should it happen that the focal power differs, the inequality will be thus discovered, and a suitable glass must then be adapted for each eye.

Lenses are made generally from the best plate glass. They should be perfectly clear and pure, and free from specks or veins, and of an equal thickness in all their parts. They can be examined by holding them between a lighted candle and the eye and moving them backwards and forwards; any irregularity will be thus easily detected. If they are moved in the same way between the eye and printed letters, the letters will appear distorted if the figure of the glass is not accurate.

The frames of spectacles are a much more important part of the instrument than most persons imagine. They should fit lightly on the nose and be fixed steadily in their position. Spec-

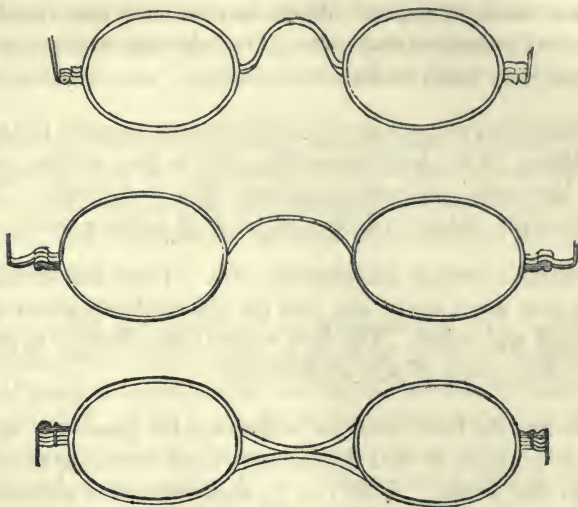
tacles that are used for viewing distant objects require to be strong in front so that the parallelism with the eye cannot be disturbed, whereas those for viewing near objects may possess a little elasticity so as to throw the plane of each glass at right angles to the axis of vision for each eye; but the most important of all points in regard to the frames is that they should be sufficiently wide in front to allow the exact centre of each glass to come precisely opposite the pupil, for if this is not so the rays that pass through the lens will not all enter the pupil, thus rendering the spectacles comparatively worthless, for vision to be perfectly distinct should be exactly through the centre of the eye-glass.

The form of the bridge must vary to suit the shape of the nose, and it should always be of a sufficient curve and width to cause the situation of the glasses, as respects the eyes, to be perfect, both horizontally and vertically. If they are properly fitted the person will have the impression of looking only through one glass.

The eye pieces should be oval or circular; oval glasses have as great a range laterally as those that are round, and are not so heavy, and they are on this account preferable.

The octagon shaped glasses that are so fashionable at present are certainly very unnatural in shape, and but another exhibition of the folly of imperious fashion; they are not at all to be recommended.

The accompanying figures represent the most proper shape and form for spectacles :



The first, for myopic persons, enables the glasses to be brought close to the eyes, which is important, but they never should approach so near as to touch the eye-lashes. The second form is suitable for presbyopic eyes, and the third can be used in either case.

As to the materials of which the frames should be composed, individual taste will doubtless have considerable influence in the selection. Gold frames are much worn, and they certainly look respectable ; but one disadvantage accompanying them is that they sometimes have the effect of dazzling the eyes. Silver spectacles are not free from this draw-back, but, if well made, they adapt themselves speedily to the conformation of the head, and are on that account very comfortable to wear.

This is a very important consideration, for if spectacles press too tightly, headache, and uneasy sensation about the temples will be the inevitable result. Those made of tortoiseshell are not now much in vogue. When they are used they should be selected of a uniform dark color. One objection to them is that they are very easily broken.

Blue steel spectacles are in many respects superior to any of the others. They look remarkably well as long as they retain their blue color, and are exceedingly light and elastic. They are, however, not so well adapted for deep concave lenses.

Spectacles require considerable care. They should be put into a case when not in use, and not left carelessly about to be scratched and soiled. The best way to clean them is to polish them with a piece of soft wash-leather.

After having been worn for some time the joints are apt to become too loose, so that the glasses do not remain as near the eyes as they ought. This can be easily remedied and should be attended to without delay, as it is always hurtful to the eyes to have too great a distance between them and the glasses. Attention to this may perhaps be stimulated by observing that until the pin or pivot of the joint be tightened it will bring away a hair or two from each temple every time the spectacles are taken off.

Pebbles are deemed by many persons cooler to the eye than glass. Whether this be so or not they are extremely hard and not easily scratched, and in this respect at least they possess an advantage over glasses which are constantly getting broken or injured, and new glasses are never satisfactory, as most persons imagine the old ones to be superior to the new.

Periscopic, from *περι*, around, and *σκοπεω*, to view, is the name applied to the spectacles invented by Dr. Wollaston, because

they give a wider field of vision than others. In these glasses the surface next the eye is always *concave*, both for long and short sight, the convexity of the outer surface being less deep than the concavity of the inner one for short-sighted persons, and deeper for the long-sighted—the double concave or convex lenses are, however, generally preferable to the periscopic.

Cataract glasses, or the glasses used by persons who have been operated on for cataract, are usually about four-and-a-half inch focus for viewing distant objects, and two-and-a-half for near objects. It is therefore necessary to be provided with a pair of each kind.

Next to the injury inflicted by wearing bad and unsuitable spectacles is the highly reprehensible and decidedly hurtful custom of using a single eye-glass or “Quizzing-glass” as it is facetiously called. This is “a custom more honoured in the breach than the observance,” for by using one eye more than the other an alteration takes place in their relative strength, and it is not the eye that gets the over-share of work which suffers so much as the unemployed one. If the glass is put up to the eye and retained *in situ* by the pressing down of the muscles, it distorts, distresses and injures the mechanism of the organ. Whoever adopt this custom for fashion’s sake, or from a desire to conceal their need of spectacles, will find it to bring with it ultimately a severe retribution.

Watchmakers, engravers and others, who apply a glass to only one eye in their business, ought to learn to use either eye alternately, and retain the glass in its place with a piece of ribbon tied round the head and not by the contraction of the muscles, and thus in some degree escape the imperfection of vision to which they are so subject.

The double hand eye-glasses are less objectionable than

the single glass; the great draw-back to them is that they cannot be fixed steadily in front of the eyes as spectacles are. Some persons have a habit of fastening them on the tip of the nose, but this, as well as the custom of letting spectacles slip down to the end of the nose, is injurious to the eyes, and can scarcely be considered any improvement to the countenance.

From what I have already urged respecting the impropriety of depriving the eyes of the advantage of a free circulation of air, or of their natural stimulus, light, it will not be expected that I can recommend *goggles*. Nevertheless, under certain circumstances they may be used advantageously in protecting the delicate eye from the hurtful effects of dust, sand, or bright sunshine, but their use should never extend beyond the period of exposure. Those that have their sides formed of gauze wire, are decidedly the best, as they allow the air to permeate their interstices.

Green and blue glasses are objectionable, for if we look through a green glass for some time and then remove it, and look at a white sheet of paper, it will not appear white but of a violet red colour. This is because the retina becomes insensible to the green rays that form part of the white light, which flows from the paper, and we see the violet red spectrum, which is the color that arises from all the rays in the white light, except the green, which the retina is unable for the time to perceive. In like manner blue glasses will produce their accidental or complimentary color—orange red. We should therefore select neutral glasses, or those that are of no definite color.

When there is great sensitiveness of the retina, these alleviate this distressing feeling, and are refreshing and comfortable to the eyes.

Many persons have injured their sight by wearing glasses

when in reality they had not the slightest occasion for them. The vision of others has been seriously impaired by deferring too long the use of spectacles, while the eyes of thousands have been ruined by wearing those that were bad or unsuitable. Gross imposition has been practiced by venders of those instruments, who, ignorant of the first principles of Optics, are totally unacquainted with the requirements of the purchaser, and by selling improper glasses, they frequently cause incalculable misery and in some cases even complete blindness; I would, therefore, strenuously recommend all who require spectacles to buy them of a respectable Optician. Pike and Sons of this city, occupy a deservedly prominent position as manufacturers in this branch of business.

In the preceding pages the opinion has been more than once intimated that the delicate and critical operations which an Oculist is called upon to perform, should never be attempted by any one whose eye and hand have not been educated by a perfect course of professional training. This is said in no spirit of invidious distinction, but from a solemn sense of its truth and vital importance.

No one can scale the heights of science at a single bound, and he who pretends to have done so draws largely on the credulity of mankind.

With these opinions as honestly entertained as they are fearlessly avowed, several friends, upon whose judgement I place implicit reliance, strongly urged upon me the propriety of exhibiting the Testimonials and Certificates of my early professional studies; the more particularly as the names attached to them are universally recognised as those of men occupying the most distinguished position amongst the medical celebrities of the age. Yielding to the solicitation of those kind friends in the

first edition of this work I added those documents in the form of an Appendix ; their republication I deem unnecessary.

I have now gone over the various subjects connected with the organ of vision, in that brief form which I proposed to myself at the commencement of this treatise. My aim throughout has been to communicate such information as would enable the reader to have a fair understanding of the eye and its dependencies and to impart, in a plain and unpretending style, the most important and useful knowledge that in a practical point of view would be most likely to benefit him. I sincerely trust that, written hastily as this has been, in moments snatched from the hurry and constant interruption of laborious and greatly increasing professional avocations, I have been enabled to render myself intelligible to all. If in this I have succeeded I shall have reason not to regret either the time or the labor devoted to the composition of this little work, and should the reader who has accompanied me throughout entertain a similar feeling as to the time and attention occupied in its perusal, our mutual satisfaction will be complete, and, until we meet again, I bid him a kind and cordial FAREWELL !

OPINIONS OF THE PRESS.

From Hunt's Merchants' Magazine.

This is a work of exceeding interest, and of great practical value. Its author is a gentleman of rare professional attainments, and has secured a high rank as an oculist and aurist—branches of his profession to which he has exclusively devoted himself. Indeed, his extensive practice, as such, has been attended with unusual success; and to this the public are indebted for much of the deeply interesting matter contained in the book before us. The subjects of which it treats, are handled with skill; and throughout the work are seen evidences of ripe scholarship, varied practical experience, and profound thought. The style of the writer is pleasing and popular, and divested of that stiffness, technicality, and dryness, which have hitherto rendered medical works so disagreeable and uninteresting to the general reader. We take pleasure in recommending the book to the profession and to the public. All are deeply interested in the preservation of that delicate and wonderfully-formed organ, to which we owe the pleasure of sight, and for this purpose the work before us should be widely circulated and carefully read.

From the Churchman.

This volume comes to confer a special benefit upon the public; and it cannot be otherwise than serviceable to all except those who unhappily are entirely blind. The author has here given the results of much observation and practice; unveiling the mysteries of his art with a most philanthropic determination to do good. The information obtained from this work will prove a manifold return for the trifling price, and it may be the means of preserving a treasure which money cannot buy.

From the Journal of Commerce.

This excellent work, prepared by Dr. J. W. Powell, of 261 Broadway, embodies the result of a long experience by an eminent oculist, in rules for the preservation, improvement, and restoration of sight, and contains a minute and accurate description of the anatomy and physiology of the eye.

(From the Atlas.)

This is a truly valuable publication, suited especially for general readers, who may feel a personal interest in the important subject on which it treats. We know of no work in which the various affections incident to the eye are described so clearly and completely, with so much candor and good feeling, as in this work. It is written in a frank and generous spirit, and with an evident desire to be useful, an object in which the accomplished author has been eminently successful. With the extensive practice which Dr. Powell enjoys, and his experience as an oculist, we might have supposed that his book must contain very valuable information. Its perusal amply confirms this expectation, and we cordially recommend it as meriting the highest character which can be given to it.

OPINIONS OF THE PRESS.

From the *Mercury*.

The author of this very interesting work, already so well and favorably known to our citizens, has succeeded admirably in making a volume that will be read with much profit and advantage. It will be found a most valuable contribution to the interesting branch of medical science on which it treats. Avoiding almost entirely the use of technical phraseology, it communicates in glowing and easy language an amount of information seldom comprised within the same number of pages. It speaks clearly and succinctly of every ailment to which the eye is subject; suggests admirable precautions, and simple remedies; points out what may be done by the individual sufferer himself, and when recourse must be had to the experienced professional man; and is, altogether, just the book which was needed by those who suffer under any impairment of vision.

From *Noah's Times and Messenger*.

This work contains much valuable information, conveyed in a form no less interesting than instructive. It describes in the clearest language the numerous ailments to which the eye is liable, and the simplest and most effectual treatment for their alleviation or removal. Scattered through the pages will be found sound and interesting advice, and no one can rise from its perusal without having derived a large amount of useful information on a subject which comes home to every man—the preservation of his eyes.

From the *Dispatch*.

We have read this work with much interest, and do not hesitate to pronounce it one of the best as well as one of the most useful contributions to Ophthalmic science with which we have met. The plan of the book is concise, its arrangements methodical, and its language graceful while it is simple. The rudiments of optics are explained, the anatomy of the eye and the theory of vision described, the various ailments and their simple treatment specified, and, what is perhaps still more important, because more easily followed by every one, invaluable suggestions are offered for the preservation of the eyes in the various walks and occupations of life, and practical instructions are given for purchasing spectacles—a matter of no inconsiderable importance, for many persons become the unconscious means of inflicting irreparable injury on their eyes by an injudicious selection of glasses. We therefore confidently recommend it to our readers, and we feel assured that it is destined to universal popularity.

From the *Courier and Enquirer*.

This is a neat and cheap work, intended to diffuse a more general knowledge than now prevails of the character, diseases, &c. of the eye, and thus to render its preservation and cure more easy and certain.

From the *True Sun*.

This work contains a large amount of useful and practical information in regard to the organ of vision. The celebrity of its author and the importance of its subject will insure a very general perusal.

From *Mearson's U. S. Bank Note Reporter*.

We have been favored by the eminent author with this excellent Treatise, and have perused it with great satisfaction. It is an exceedingly valuable work, and should be in the hands of every person. The language is chaste, elegant, and comprehensive, and yet so plain and intelligible that all may understand the subject. Anecdotes and humour abound, and so far from being a dry treatise it is extremely fascinating.

DR. POWELL'S

SELF-ACTING

EYE AND EAR FOUNTAINS,

Which obtained a Premium at the Fair of the American Institute, can be procured at his Office. Price twenty-five dollars each. *See a description of their use at page 102 in this work.*

The Self-Acting Fountain is, beyond all question, the simplest and most efficacious remedial Agent ever invented in cases of Nervous Weakness and Debility of the Eyes. In Amaurosis. Chronic Ophthalmia, Ulcers of the Cornea, Granular Lids, Ptosis or Falling Down of the Eyelids, Fistula Lacrymalis. Stoppage of the Tear Passage or Watery Eye, Weakness of Sight, and in all other cases where a tonic and invigorating remedy is required.

The apparatus is also eminently serviceable in various affections of the Ear—as Nervous Deafness, Noises in the Ear, Hardened Wax, or where this secretion is deficient in quantity or quality, and it is the safest and most rapid means of curing Chronic Discharges from the Ear. It is also employed with great advantage in Catarrhal Affections of the Nose, Ozæna, and in Nervous Headache.

DIRECTIONS FOR USE.

Pour water into the basin. Charge the reservoir therewith by a few strokes of the piston. If additional power is required continue to pump in air, after the water, for one or two minutes.

FOR THE EYE.—Hold the flexible tube opposite the closed Eye, turn the stop-cock, and a stream will be propelled from the pipe which may be allowed to play on the closed Eye and surrounding parts for five or ten minutes at a time.

FOR THE EAR.—Draw the Ear a little upwards and backwards. Introduce the Jet as far as can be done without pressing on the passage, then let the stream be directed around, from side to side, for a few minutes.

FOR THE NOSE.—Insinuate the pipe for a short distance upwards and backwards into the nostrils. Guide the stream in different directions, at the same time inhaling air through the nose so as to cause the water to pass towards or into the throat.

FOR NERVOUS HEADACHE.—Put on the rose jet, and cause a strong shower to play on the temple and forehead, until relief is obtained.

An Air Douche, or stream of air, may also be propelled from the Fountain in some cases with considerable effect.

The water may be warm, cold, or medicated, according to the nature of the case and the feelings of the individual.

Dr. POWELL imports, and has always on hand, a large supply of

ARTIFICIAL EYES,
Of superior beauty and finish.

Dr. POWELL wishes to inform persons residing at a distance, who may be desirous of obtaining his opinion in any of the various affections of the EYE or EAR, that by answering the following interrogatories, and enclosing a Fee, their communication will receive immediate attention :—

GENERAL QUESTIONS.

1. What is your name ?
2. Where do you reside ? Is your dwelling near a marsh, sheltered by woods, or exposed to the winds ? If in a town is it on the sunny side of the street ? Is it a healthy, airy, and elevated location, or low and damp ? Is it a new or old settlement, in the interior, or near the sea side, or the lakes, or a river ? Have you fever and ague, or any other fever in the neighbourhood ?
3. How old are you ?
4. What are your usual occupations ?
5. Are you married or single ?
6. Are you nervous or low-spirited ? Are you annoyed by any domestic affairs, or suffering from mental anxiety ?
7. Is there an hereditary predisposition to any particular disease in your family ?
8. Do you suffer from fullness of blood or determination to the head ?
9. Are you troubled with indigestion or dyspepsia, or any eruptive affection, or have you any other disease besides that on which you consult me ?
10. Are you much exposed to the vicissitudes of the weather ?
11. Do you easily perspire ? Do you suffer from cold feet ? Are you susceptible of taking cold ?
12. Is your appetite good ? Are your bowels regular, and the motions healthy ?
13. Do you drink much beer, cider, wine, spirits, coffee, tea, or other exciting liquors ?

14. Do you use much tobacco, if so, do you chew, smoke or snuff?

15. Have you taken large quantities of any medicine, as mercury, quinine, opium, pills, &c.?

16. Are you of full body or spare? What is your temperament? Is your skin fair or dark? How many times does your pulse beat in a minute? Is your tongue generally clean or furred?

17. Do you take much exercise in the open air, or are your occupations sedentary? Are you always occupied either mentally or bodily?

18. Has any long continued or profuse discharge been hastily suppressed?

19. Are you aware of having any idiosyncrasy or peculiarity of constitution?

20. Have you any other remark to make on your general health or early habits?

NOTE.—There are other queries which it is important to have answered, but which cannot well appear in print. They will, however, readily suggest themselves to the intelligent patient.



QUESTIONS TO PATIENTS WHOSE EYES ARE AFFECTED.

1. What is the color of your eyes?

2. How long have they been affected? Was your sight previously strong, or has it never been so?

3. When your eyes were first attacked were you suffering from any other sickness, if so, what?

4. Did the disease come on slowly or suddenly.

5. Do you know the cause? Was it from an accident, from cold, from overtaking the eyes, from exposure to intense heat or brilliant light, &c.?

6. Was it accompanied by pain in the eye, or head, or temple, or brow; if so, was it a dull and heavy, or sharp and acute pain? Is it worse at night?

7. Can you recognise your friends across the street, or read the signs? At what distance can you read ordinary print?

8. Can you always see at the same distance, or under what circumstances does your sight vary? Do you see better at one time than another, as in the morning, at noon, at night, after or before a meal?

9. Have the seasons an influence on your disease?

10. Have your eyes ever been thoroughly examined by an oculist? What was his opinion of your case?

11. Has any surgical operation ever been performed on your eyes?

12. What treatment have you received? What have been its effects?

13. Have you ever used spectacles, if so, have they been a relief or otherwise?

14. What change has taken place in the outward appearance of your eyes?

15. Have you experienced a sensation as if sand or dust was lodged in the eyes? Does the motion of the lids over the eye ball cause pain or irritation? Is exposure to light painful?

16. Is the eye weak and watery, or is there a greatly increased flow of tears?

17. Are the blood-vessels enlarged and distended? Can you trace them coursing over the *cornea* or clear part of the eye?

18. Is there any discharge of mucous matter? Do the the lids adhere together in the morning after sleep?

19. When the disease first commenced, were the lids much swollen and was there a considerable discharge of thick matter?

20. Do you know whether any granulations exist, that is, whether the inside of the lids are smooth or rough?

21. Is the *cornea* or front part of the eye clear or opaque? Does it possess its natural lustre or is it cloudy and smoky? Is there any thing growing over it? Are there, or have there been any ulcers upon it?

22. Are the eyes of their natural size and form?

23. Is the *pupil* enlarged, contracted, immoveable, or irregular in shape? Has it a bright black appearance? Can you see any thing *behind it* like a cobweb, or an opaque yellowish or pearl colored substance?

24. When your sight was first affected did it appear as if a cloud or smoke was interposed between your eye and all objects?

25. Do you see better in the evening or in a moderate light, or with your back to the window than otherwise?

26. If you look at a candle is the flame surrounded by a vaporous halo or white circle?

27. Did your vision become gradually obscure, objects at first seeming confused; as for instance, after reading some time, the letters not appearing to be distinctly defined but running into each other?

28. Do you see better by holding the object in a particular direction? Has your vision ever been double?

29. Have you perceived moving motes or spots floating in the air, ascending and descending, or have you perceived branches or hairs or a network intervening between the eye and objects?

30. Is there any pain, giddiness, or sense of heaviness in the brow or temple?

AFFECTIONS OF THE EYELIDS AND ADJOINING PARTS.

31. Is there an itching sensation in the eyelids? Are the eyes suffused with tears? Do they present a red unpleasant appearance, especially in the morning?

32. Do the eye-lashes fall out, or have they a tendency to grow in towards the eye-ball? Has the lid an inclination to grow in or out?

33. Are you subject to styes?

34. Does the eye-lid droop or hang over the eye?

35. Has there been any swelling near the inner corner of the eye at the root of the nose; if so, did matter form in it? Did it burst, or was it opened by a lancet? Has it closed?

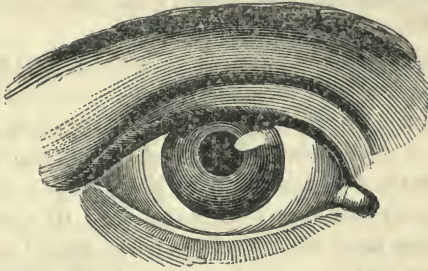
STRABISMUS.

36. How long has the squinting existed? To what cause do you attribute it? Are both eyes implicated? In what direction is the eye directed? Is it always crooked, or sometimes straight?

TO PERSONS REQUIRING ARTIFICIAL EYES.

37. How long since you lost your eye, and from what cause? Is it much diminished in size? Is it a right or left eye? Is it tender or healthy? Have you ever worn an artificial eye?

State the color of the iris of the sound eye; draw the size of the healthy eye, of the cornea and of the pupil thus:—



Artificial eyes can be safely forwarded to all parts of the Union.

QUESTIONS TO PATIENTS WHOSE HEARING IS AFFECTED.

1. How long have you been deaf? Was your hearing perfect previously, or has it never been so? Are you considered deaf by your friends? Is the dulness of hearing occasioned by a habit of inattention? Are you accustomed to ask people who address you to repeat what they have said?

2. Are you, or have you been subject to occasional hardness of hearing or to ear-ache?

3. When the deafness commenced, were you suffering from any other complaint, and if so, of what nature?

4. Do you recollect how the deafness began? Did it come on insensibly, and increase gradually, or was the attack sudden?

5. Do you know the cause? Was it by a blow or other accident? from bathing, or from a loud noise as firing of cannon, &c. Did you suffer from pain in either ear, or in the head, when it commenced?

6. Had you any discharge from either ear? Of what nature was it, and how long did it last? Had you much itching or irritation in the ear passage, and have you been in the habit of frequently using an ear pick?

7. Was the deafness accompanied from the beginning with noises in the head, and of what nature were they? Did they resemble the falling of water, the blowing of wind, the rustling of leaves, the tinkling of a bell, the strokes of a ponderous hammer, the noise of a locomotive, or the beatings of the pulse?

8. Are those noises always equally troublesome, or more at one time than another, and under what circumstances have you noticed the difference?

9. Did they precede or follow the hardness of hearing, and has the severity of the deafness appeared to you to depend on the degree of noise, or to be wholly independent thereof? Do they still continue?

10. At what distance from the ear (reckoning by inches) can you hear the tick of a watch of moderate power, or can you only hear it when placed close to the ear, or can you not hear it at all?

11. Is the distance at which you can hear always the same, or under what circumstances does it vary?

12. At what distance can you distinguish the voice of a person addressing you who speaks distinctly?

13. How is your hearing in society? How do you hear when riding in a carriage or a rail-road car?

14. Do you hear better when there is a great noise or when silence prevails? for example, do you hear the voice of any one better (that person being at a certain distance) while a carriage is passing, a drum beating, a grand concert performing, or during any other loud noise?

15. Are there sounds or voices which are particularly disagreeable to you? Can you distinguish the weaker musical notes?

16. Is your hearing affected by the wind or the weather? Do you hear better in summer or in winter, in the open air or in a room?

17. How is your hearing when stooping, lying down, tired, annoyed, or ill; as, for instance, when suffering from a cold, cough, or headache, or after indulging in wine, spirits, or high-seasoned meats, or after a full meal?

18. Have you any unpleasant sensations in the external ear or in the ear passage? Are the ears ever or always swollen, or not? Is there a due secretion of healthy wax?

19. Do small pieces of whitish membrane, or of bone, ever come away from the ear, or is there any discharge? if there is, is it constant or occasional, thick or fluid, abundant or scanty, yellowish or otherwise? Is it offensive or tinged with blood?

20. Is the hearing affected by the quantity of discharge? Does headache or other pain follow its cessation?

21. Do you experience any peculiar sensations when sneezing, yawning, swallowing, or when blowing your nose.

22. If you endeavor to make a powerful expiration, the mouth and nose being firmly closed, do you experience a sensation in the in-

terior of either or both ears, as if the air was endeavoring to escape through them? or do you hear a whistling in them? Does the attempt cause *tinnitus aurium* or noise in the ear, or increase that already existing?

23. Have you ever heard a sudden loud noise in the interior of the ear? Was the hearing better after that noise? and how long did the improvement last?

24. Has the state of your ears ever been *thoroughly* examined, by an Aurist, with or without instruments? State the opinion given of your case?

25. Were they examined with the aid of the sun's rays, or of an illuminated auriscope?

26. Has any surgical operation been performed on the ear or throat? Have your ears been effectually syringed by a regular aurist?

27. What is the nature of the treatment that has been adopted? and what effect did it produce? Did you attend to the advice of your medical attendant? and how long did you pursue the plan recommended to you?

28. Have you used any hearing trumpet, or other acoustic instrument? What? and with what effect?

29. Do you hear much better when you place the hollow of your hand behind either or both ears, or is the improvement but slight?

30. Has the deafness been increased by a too early or long continued use of acoustic instruments?

Questions respecting the deaf and dumb would be useless, as they must submit to a personal examination.

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